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ABSTRACT

This annotated bibliography lists books and articles that have direct application to managing the human side of knowledge acquisition, transfer, and application. What is meant by the human dimension of knowledge is how motivation and learning affect the acquisition and transfer of knowledge and how group dynamics mediate the role of knowledge in an organization. Thus, the texts cited in this bibliography focus on building knowledge-management (KM) cultures that affect organizational productivity and success. The report is divided into four sections. Section one contains annotations of 60 works that represent current thinking on the emerging field of KM. The next three sections organize information into those subject areas most frequently addressed by people responsible for organizational transformation efforts. Section two, "What is Knowledge Management?" sums up varying working understandings of KM and shows how KM differs from purely technology-driven data management. This section addresses the differences between explicit and tacit knowledge and their derivations and also gives examples of KM efforts in contemporary organizations. Section three explores the frameworks that apply to culture building, and section four identifies projects and tools that can enhance success. An appendix outlines additional resources, with a focus on the World Wide Web. (Contains three indices.) (RJM)

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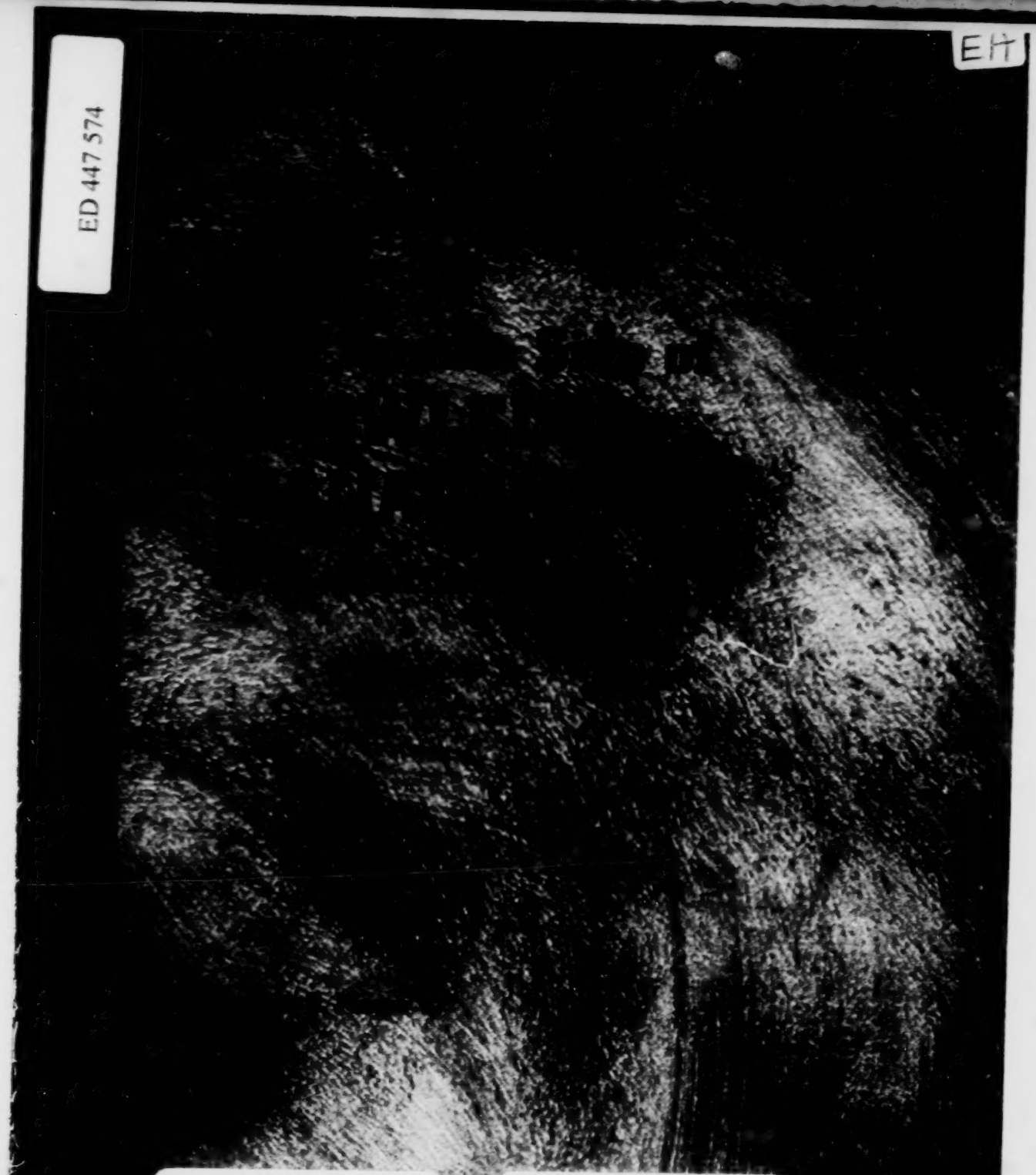

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The Human Side of Knowledge Management

An Annotated Bibliography

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Pamela S. Mayer

Center for Creative Leadership
Greensboro, North Carolina

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Table of Contents

Preface vii

Introduction 1

Section 1: Annotated Bibliography 3

Section 2: What Is Knowledge Management? 55

Working Understandings 55

Explicit Knowledge Versus Tacit Knowledge 57

Organizational Examples 59

Section 3: How to Build a Knowledge-sharing Culture 61

Frameworks for Knowledge Transfer 61

Communities of Practice 62

Work Practices and Outcomes 63

Section 4: Implications for Leadership 65

Practicing Leaders 65

Knowledge Management Projects and Tools 66

New Roles and Structures 68

Appendix: Additional Readings and Web Sites 71

Author Index 73

Title Index 74

Company Index 76

Preface

After spending several years at the Center for Creative Leadership thinking about and observing changes in leadership development practices, I began to see the importance of knowledge management (KM) to transforming leaders and organizations. Some of this insight came from being a part of CCL's own efforts to transform itself and accelerate the development of intellectual capital in the form of new programs, products, and services. But the greater part of my understanding was developed out of observing the almost universal difficulties associated with sharing knowledge.

I also came to understand that many individuals understand KM from solely the technical perspective—that is, as database management and as a means of disseminating information. Over time, however, I realized that the human side of KM—that is, patterns of communication that are critical to facilitate the transfer of insight among group members—should attract equal attention. It is this neglected part of the equation that provides the richness and breadth that KM confers on organizations.

A primary role of leaders is to create the context and infrastructure that will enhance learning and facilitate the transfer of knowledge throughout their organizations. This means that leaders need to nurture both explicit and tacit learning; install the databases, software, and hardware to support the information infrastructure; and create the human communication patterns essential for sharing knowledge and producing insight.

Thus, having become more conscious of these needs as a critical element in leadership development, I investigated the literature and developed this bibliography. It explicitly explores the human side of knowledge management.

I am grateful for the opportunity to review the literature in this emergent field, and especially, I am grateful for the wise editorial guidance of Marcia Horowitz of CCL. I also thank Nancy Dixon and John Fleenor for their excellent feedback and suggestions for the final document. Finally, source recommendations from John S. Brown at Xerox Corporation were invaluable during my search.

Introduction

Practicing leaders are seeking information that can help them in their leadership roles and responsibilities. The rapidly growing field of knowledge management (KM) is one area of particular interest; not only because it is new but because skill in KM is essential for leadership success, particularly in these turbulent times. Leaders are charged with understanding how to gather and use the vast amounts of information available in order to make sense of and confront both familiar challenges and those that have no precedent.

The KM subject area is quite large and ranges from artificial intelligence to data mining and includes such diverse topics as sociology, complexity theory, and strategic planning. There is already much being written on the technology of KM and hundreds of commercial vendors are putting their hardware and software products into the marketplace to aid in the aggregation, retrieval, and utilization of knowledge. At the same time, too much is still unknown about the human interactions, or "soft" side, of KM.

By the soft side I mean the human or nonmachine dimensions of knowledge. For example, how do motivation and learning affect the individual's acquisition and transfer of knowledge, and how do group dynamics mediate the role of knowledge in an organization? The executive editor of *Wired* magazine, Kevin Kelly, affirms the importance of this soft side. In his recent book, *New Rules for the New Economy* (1998), he argues that communication is not just a sector of the economy but is actually the economy itself. The key premise of his book is that the principles governing the world of the soft will soon govern the world of the hard. In other words, the humanistic trumps the mechanistic when it comes to the management of knowledge in the twenty-first century.

Thus the purpose of this bibliography is to present annotations only on those books and articles that have direct application to managing the human side of knowledge acquisition, transfer, and application. In particular, I have included most of the seminal thinking on building KM cultures that affect organizational productivity and success.

The audience for this report is practicing leaders, whether they work in traditional manufacturing or newer technology-related industries, or in government and nonprofit services. In short, any manager in a business whose future depends on its ability to capitalize on intellectual assets should find these annotations helpful.

The report is divided into four sections. Section 1 contains annotations on sixty works that represent current thinking on the emerging new field of

KM. The annotations are descriptive summaries meant to help readers decide if they wish to access the complete work.

The next three sections organize information from the annotated works into those subject areas most frequently addressed by people responsible for organizational transformation efforts. Section 2, "What Is Knowledge Management?" sums up varying working understandings of KM and shows how KM differs from purely technology-driven data management. This section addresses the differences between explicit and tacit knowledge and their derivations and also gives examples of KM efforts in contemporary organizations.

Section 3, "How to Build a Knowledge-sharing Culture," explores the frameworks that apply to culture building. This section is concerned with the role of communities of practice and other work practices that influence a knowledge-sharing culture.

Section 4, "Implications for Leadership," pays particular attention to practicing leaders. Some KM projects and tools are identified, with criteria for successful projects highlighted. Finally, this section reviews some thinking regarding roles and structures that may be needed to facilitate KM within contemporary organizations.

The Appendix outlines some additional resources, with a particular focus on those found on the World Wide Web. These Internet resources are expanding daily, and this list is not intended to be exhaustive. Instead it is meant to stimulate the reader to look for the increasing numbers of such resources, especially Internet-based resources, as the KM field continues its growth over the next few years.

The Title Index and Author Index offer easy access to the content and to those who provide that content. In addition, a Company Index provides access to specific company KM practices and references reported here.

Section 1: Annotated Bibliography

The knowledge management (KM) literature is practitioner oriented, largely because by its very nature KM is considered an application of knowledge. Even the several works included here that refer to current and needed research focus on KM practiced within organizations rather than as an academic pursuit.

The works annotated in this section were identified through extensive searches in several databases and Web sites and from strong personal recommendations. The *ABI Inform*, *PsychLit*, and Online Computer Library Center databases were included in the search. The proceedings from the Berkeley Forum sponsored by the Haas School of Business were also very useful as was the @Brint.com Web site.

In every case, the work selected met the following criteria:

1. It had practical implications for practicing leaders.

2. It conceived of knowledge as more than a cognitive process: that is, it contained recommendations for the transfer of thought to action.

3. It considered sociocultural practices part of knowledge management.

The annotations are arranged alphabetically by first author's last name. The Author Index at the end of this report lists all authors included, and the book and article titles can be found in the Title Index.

Abramson, G. (1999, March 15). Wiring the corporate brain. *CIO Enterprise*, sec. 2, pp. 30–36.

Abramson provided an in-depth profile of the efforts of one organization (Novartis AG) to use KM initiatives throughout its global operations. Born of the merger in 1996 of Sandoz and Ciba-Geigy, Novartis AG is now a $24 billion corporation dedicated to the life sciences industry. Its products include pharmaceuticals, baby food, contact lenses, animal health products, and genetically engineered seeds. The question is whether a company that depends on innovation to survive can not just share its knowledge but also increase it.

Novartis calls the sharing process *knowledge networking* because that term seems less hierarchical than knowledge management. Novartis's managers understand that making the most of intellectual assets is more a cultural than a technological challenge. That's why Novartis has set up *knowledge scouts* in each of its business units worldwide; their mission is to lead in the search for cutting-edge technology and bring colleagues into on-line brain-

storming groups that will facilitate sharing of new technologies across business units.

Novartis also maintains the *Knowledge Marketplace*, a resource that includes a corporate Yellow Pages of staff experts, blue pages of outside experts, and a virtual bulletin board and technology scouts forum.

Four times a year Novartis holds knowledge fairs, which consist of face-to-face, open-ended meetings of scientists and businesspeople from throughout the organization. These meetings are essential; without them participation in the on-line groups is difficult to maintain.

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Amidon, D. M. (1998). Blueprint for 21st century innovation management. *Journal of Knowledge Management, 2*(1), 23–31.

The challenge of the next century is to determine the integral linkage between human potential and economic performance. The author contended that creating a culture in which knowledge is valued and shared effectively is one of the most difficult challenges faced in management practice. One reason is that culture extends beyond the enterprise to include suppliers, customers, competitors, alliance partners, and distributors. All of these factors contribute to a *strategic business network*, from which she derived a model.

Recent publications are cited that document the foundation for an economic climate based upon the value of human potential and the flow of knowledge. Amidon maintained that the most distinctive feature of the knowledge economy is not that it churns out information for consumers but that it uses knowledge as both an input and an output. However, knowledge is more difficult to measure than traditional inputs because intangible products don't align with the old statistical boundaries between manufacturing and services.

The challenge of measuring learning and knowledge creation's contribution to the bottom line will continue to be an obstacle until nonfinancial standards of performance gain wider use. Economists' ideas on innovation are changing also, especially in view of the importance of *tacit* as well as *codified* knowledge. Indicators are needed to track the flow of ideas.

Amidon discussed the Global Knowledge 1997 conference in which 2,000 participants from 144 countries attended sessions designed to explore the role of knowledge and information in economic and social development. As follow-up in 1998, the *World Development Report* was prepared on the theme "knowledge for development." It addressed the following topics: increases in production, distribution, and use of knowledge; history, culture,

and incentives; the economics of knowledge; implications for country strategies, sectors, and income distribution; strategies for households and firms; the appropriate role for government-related global issues; and areas for collaboration.

Recent initiatives from the European Union, the World Bank, and the Organization for Economic Cooperation and Development were discussed. The author also provided a sample knowledge innovation test and alluded to the full test of over seventy questions. She concluded that, increasingly, management responsibilities will be viewed as facilitating learning.

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Brand, A. (1998). KM and innovation at 3M. *Journal of Knowledge Management*, *2*(1), 17–22.

3M concentrates on the tacit-to-tacit area of knowledge transfer, in the belief that if this is functioning well, other aspects of KM will fall more readily into place. The author, using the experience of 3M in sustaining its learning culture as an example, showed that individuals' willingness to share knowledge is directly affected by the culture within their company.

KM is seen at 3M as more a cultural and organizational issue than a technological one. 3M believes that people have to be motivated to access and share information in order to convert that information into knowledge. It is understood that in a nonsupportive context, a KM infrastructure will atrophy. 3M also employs a wide variety of programs for supporting KM; these include technology fairs, technology audits, and internal grants and awards. Some of the approaches that 3M employs to create the right context include the following:

1. Continuity: stressing promotion from within and lifetime employment policies.

2. Loyalty: using very few if any short-term employment contracts.

3. Tolerance of mistakes: taking the long view, and investigating mistakes and learning from them.

4. Storytelling: especially recounting stories that allow a healthy disregard for management but encourage innovation.

5. A flat organization: allowing important decisions to be made at all levels; using self-organizing systems because they are more adaptable.

6. Encouragement of innovation: includes defining needs that could use 3M technology and allowing new technologies that then require product applications to emerge.

7. Cross-divisional cooperation: placing a stretch target on all 3M businesses for new product sales (30 percent of sales from products not in the

line four years ago), motivating groups to explore the technologies used by other 3M groups; this sets up internal transfer of learning.

8. Coping with chaos: recruiting the ideal people to 3M, that is, those who want to start things rather than inherit businesses.

***

Brown, J. S. (1998). Research that re-invents the corporation. In *Harvard Business Review on Knowledge Management* (pp. 153–180). Boston, MA: Harvard Business School Press.

The author, who is director of the Xerox Palo Alto Research Center (PARC), described the chief product of Xerox as the customers' learning. At PARC, researchers are developing prototypes for new work practices as well as new technologies and products. Brown contended that successful companies must use research to reinvent the corporation. He had four basic premises:

1. Research on new work practices is as important as research on new products.

2. Innovation is everywhere; the problem is learning from it.

3. Research can't just produce innovation; it must *coproduce* it.

4. The research department's ultimate innovation partner is the customer.

The author wrote that information technology, now a distinct category of products, will become invisible and dissolve into the work itself. Companies like Xerox might not sell products but rather expertise to help others define their needs and create the products best suited to them. He defines a key research task as finding out how the company rejects new ideas—this will reveal features of the corporate culture that need to change.

The ultimate partner in coproduction is the customer. Xerox was trying to model a need or use first, before prototyping a new system. By studying collaboration with its customers, it hoped to learn valuable lessons regarding coproduction. This focus was based on a commitment to solving real problems in the real world; that is, to technology in use.

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Brown, J. S. (1999, Spring). Sustaining the ecology of knowledge. *Leader to Leader*, pp. 31–36.

Organizations that create value from new products, services, and ideas will prosper. Those that fail to build the intellectual capacity and personal engagement of their members will stagnate.

Brown maintained that the distinction between low-tech and high-tech products is fuzzy at best. The performance of almost all products—cars, appliances, medical equipment, and so forth—is improving at breakneck speeds. Power in the new economy is shifting to the smallest possible units.

Therefore, leaders must move from just making products to making sense. They must find ways to foster intellectual capital that becomes inextricably bound to a sense of personal meaning. Essential to the process of knowledge creation is the adoption of shared beliefs. This process is largely social, and thus an organization is a *knowledge ecology*. Leaders must be both bold and grounded.

The author contended that a healthy knowledge ecology needs two types of contributors: a senior scientist (analytical, focused, consistent) and a hungry artist (playful, transcending boundaries, unpredictable). His experience at Xerox PARC showed him that artists and scientists collaborate naturally because both are pursuing inner truth and self-expression.

Brown talked about the learning community of 20,000 technical representatives who have a Web site where they can post their insights. The development of this community has demonstrated how social capital is created simultaneously with intellectual capital. Leaders must build systems that support the interplay of both and respect both. Thus leaders must attend to social patterns and practices, not just to strategy and technology.

The concept of communities of practice can be extended to broader geographic spaces. He cites Silicon Valley, Hollywood, the New York financial district, and others. These centers of expertise are the result of regional knowledge ecologies. All regional ecologies create their own social architecture; that is, structures and cultures that allow members to both construct and consume knowledge.

The author concluded that in the knowledge economy management gives way to mission. The commitment that people make to the continuous generation of knowledge is what gives life to all communities.

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Brown, J. S., & Duguid, P. (1998). Organizing knowledge. *California Management Review*, *40*(3), 90–111.

This article asserted that a knowledge-based view of the firm has risen to counter the transaction cost approach of the conventional economy. Although knowledge is often thought to be the property of individuals, the authors contended that knowledge is both produced and held collaboratively. Therefore, knowledge is social in character and also difficult to organize outside its community of origin. One cannot assume that once found, knowl-

edge will travel easily. Knowledge that is part of the organization's core competency is more than *know-what*, or *explicit*, knowledge; often it is *know-how*, or *tacit*, knowledge.

Most formal organizations are not single communities of practice but rather hybrid groups of overlapping and interdependent communities. Therefore, cross-divisional synthesis is itself an achievement. But the authors suggested that organizations must reach even beyond synthesis to synergy to produce true coherent organizational knowledge. This is a different outcome than simply collecting the scattered, uncoordinated insights of each individual. In fact, they suggested that organizational knowledge across hybrid communities is the essential activity of management. Although many managers may feel that the solution lies in better techniques for search and retrieval, such an approach doesn't address the whole issue.

Due to its social origins, knowledge moves differently within communities than between them. What looks like a best practice in one location may not turn out to be the best practice in another geographic region, for example. The authors believed that firms need to work toward synergy across their various communities or they will lose their edge over the market. Further, any tendency of knowledge to spread easily reflects not suitable technology but suitable social contexts. Creating such contexts is the task of the managers or leaders.

The authors discussed an architecture for organizational knowledge and suggested that successful devices such as the telephone and the fax, like the book and newspaper, spread rapidly not simply because they carry information to individuals but because they are easily embedded in communities. Technologies that can recognize how relations within communities differ from those between communities are needed. In fact, understanding the challenge of the *between* relations is a significant issue for the new design of both technology and organizations. Distributed know-how is possibly much more important than the aggregation of data.

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Cleveland, H. (1997). *Leadership and the Information Revolution*.
Minneapolis: World Academy of Art and Science, 70 pages.

Cleveland stated that information processed by human brainwork into knowledge and integrated into wisdom has become the most important resource in the world today. He shared six propositions:

1. Information expands as it's used, unlike the other resources that have dominated the recorded history of civilizations.

2. Information is less hungry for other resources. The higher the technology, the less energy and raw materials seem to be needed.

3. Information can, and increasingly does, replace land, labor, and capital.

4. Information is easily transportable—at almost the speed of light and sometimes, by telepathy and prayer, much faster than that.

5. Information is transparent. It has an inherent tendency to leak. And the more it leaks, the more we have and the more of us have it.

6. Information is *shared*, not *exchanged*. An information transaction is not an exchange transaction, because both parties still have the information after they have shared it.

In chapter 2, the author elaborated on these six principles and pointed out how the bases for hierarchy and discrimination that have existed in the past are crumbling, because it is symbols, not things, that are the world's dominant resource.

In the following six chapters he outlined the implications for leadership. First, the people, not their formal leaders, are doing the leading. This is due to the spread of knowledge, and it turns upside-down the traditional model with policymakers at the apex of the pyramid. He gave several examples of this shift. He went on to suggest that the leadership competency most needed is the ability to facilitate a dialectic, or two-way conversation.

The author talked about education as the foundation for success and suggested that information resources are harder than other resources for the rich and powerful to hide or hoard. The implication is that with information as the world's dominant resource, the prospects for fairness are improved. Societies that try to maintain rigid hierarchies will eventually implode.

The interaction between the knowledge society and how we handle issues of diversity were discussed next. Also, Cleveland suggested that the ratio of intuition to reasoning is bound to keep rising and that leaders had better fall in love with chaos and complexity in this new context.

He ended with a section, "Attitudes of Leadership," in which he argued that for the generalist leader, the steepest part of the learning curve is not acquiring skills but attitudes.

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Cohen, D. (1998). *Managing knowledge in the new economy*. New York: The Conference Board, 26 pages.

These proceedings (Conference on Organization Learning, April 1999) reflected the thinking and practice of several practitioners and academicians

who use and study KM. The term KM was used throughout the proceedings to represent the entire range of KM work—from creating documents on-line to building a culture of trust. Some practitioners at the conference, however, questioned the validity of the term KM because knowledge cannot be readily measured, organized, and controlled, especially the knowledge possessed by experts. One of the companies present, Johnson & Johnson, preferred the term *knowledge networking*.

Laurance Prusak of IBM Consulting pointed to the difference between a firm's market value and the value of its tangible assets as one indication of the worth of intangibles, most of which are organizational knowledge.

Other speakers asserted that knowledge initiatives focus primarily on either exploitation (this includes replication and reuse) or innovation (re-creation of new knowledge). It was noted, however, that these two uses are not inseparable. For example, any knowledge exchange has the potential to spark innovation, and making knowledge widely available in organizations may lead to both reuse and innovation. Although theorists believe that knowledge for innovation promises greater long-term value than knowledge for efficiency, most U.S. KM projects focus on exploitation rather than exploration.

Many of the speakers emphasized a triadic approach to KM that integrates the human, organization, and technology components of a KM environment. Several frameworks were presented using this holistic approach. Prusak referred to the *social capital* component of overall knowledge capital. Not an attribute of individuals, it exists in the relationships between people and involves norms of collaboration. The essential ingredient of this social capital is trust, or the confidence that helping others will be recognized and repaid. Time and space for connecting are also vital to social capital, as are shared experiences.

The attendees agreed that customer focus is a central KM theme. In fact, some knowledge efforts are directed at building customer knowledge. The World Bank, for example, lends money to developing countries, but intellectual capital is increasingly the most critical resource offered to these countries. Likewise, IBM product development, which used to start with research, now uses customers' problems and needs at its beginning stage. As a result, the company has moved from ninth to third in its industry in terms of customer satisfaction.

Section 3 of the proceedings dealt with concepts, issues, and technologies of KM. The scarcest commodity in knowledge-intensive firms is not customers or technology or capital, it is people. Talent shortage is the biggest

obstacle to growth and solving it is the biggest strategic priority. A critical feature of knowledge work is that it requires multidisciplinary expertise and mutual learning in order to achieve a synthesis of technology and knowledge domains.

One way to measure KM is to assess its ability to increase earnings through more effective creation and management of intellectual assets. The dynamics of intellectual capital require a new type of leadership capable of bringing about fast and fluid changes in an organization. The test of a KM system is the determination of whether it is a by-product of the firm's operations or an explicit objective of those operations.

Section 4 dealt with knowledge technologies and the mechanisms of transfer between individual and organizational knowledge. These fall into three categories: knowledge-creating transfers (tacit to explicit), organizational learning (organizations as collectives learn from their environment), and absorptive capability (ability to recognize the value of new ideas, assimilate them, and apply them to commercial ends). This section also summarized the evolution of *groupware*, or electronic collaboration tools, in KM. A functional taxonomy of groupware was proposed, ranging from e-mail through collaborative Internet-based applications and products.

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Cohen, D. (1998). Toward a knowledge context: Report on the first annual University of California Berkeley Forum on Knowledge and the Firm. *California Management Review*, *40*(3), 22–39.

This forum brought together experts on KM from both the Eastern and Western hemispheres. All agreed that knowledge is a valuable asset that cannot be ignored in today's market. But there were also some notable differences. For example, Western culture, such as in the United States, focuses mainly on explicit knowledge and near-term gains; whereas Eastern culture, such as in Japan, focuses on tacit knowledge and long-term advantage. These differences can literally distinguish success from failure.

Ikujiro Nonaka, the Fuji-Xerox Distinguished Professor in Knowledge at Haas School of Business, introduced the idea of *ba* to Western culture. Professor Georg von Krogh of the Institute of Management at the University of St. Gallan presented his research on the role of *care* in knowledge creation. Knowledge projects by managers of IBM and Dow Chemical and the president of the American Productivity & Quality Center were examined. Several other aspects of KM were also examined by these leading researchers, such as measurement methods and knowledge vocabulary.

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Davenport, T. (1996, March 1). Think tank. *CIO Magazine*, pp. 24–26.

This article was about the human aspects of information and the roles associated with it. Successful software must address social and behavioral change. Currently, it is nobody's job to deal with these issues, so most systems don't succeed in delivering the intended business value.

A recent study suggested that more than 90 percent of business-critical systems projects fail. The author could not think of a situation in which Lotus Notes, for example, changed how the work was done and decisions were made. He argued that we need to be serious first about changing the "information behavior" of individuals and groups.

One alternative is for system developers to take on the responsibility of organizational change. But the author concluded this was unrealistic. He recommended organizations acquire *social systems analysts* (SSAs), who would be responsible for the following tasks:

1. Shadow managers and workers to determine actual information needs and likely usage of planned systems.
2. Participate in system design to fit the system to organization structure, culture, and behavior.
3. Facilitate user participation in the design activity in order to improve the system and acquire user buy-in.
4. Assess current work processes and create new ones.
5. Plan the implementation and introduction, including education and training.
6. Observe the new system in use and make changes.

Successful SSAs need to be experienced people because they learn about change primarily through work projects, not books and classrooms. At Digital Equipment Corp., for example, management paired a change expert with a technology expert and a business analyst on all major projects.

The author argued that now is the time to establish the role of the SSA. Preventing one large system failure will pay for a change specialist for many years.

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Davenport, T. H., DeLong, D. W., & Beers, M. C. (1998, Winter). Successful KM projects. *Sloan Management Review*, pp. 43–57.

These authors focused on tangible KM projects in order to see how these efforts are changing business. Although the authors acknowledged that none of the projects were optimal, the thirty-one KM projects studied in twenty-four companies did allow the development of a typology. From this the authors derived key characteristics of a successful KM environment.

The projects studied were of many different types, including research and development, sales, and production. They were funded through various combinations of corporate and self-funding. Some projects were corporate in their management and others decentralized. They had four broad types of objectives: (1) create knowledge repositories, (2) improve knowledge access, (3) enhance knowledge environment, and (4) manage knowledge as an asset.

As part of the process for identifying characteristics associated with successful projects, the authors used success indicators similar to those in any business change project: growth in resources attached to the project, growth in volume of knowledge content usage, probability of project survival without the sponsor, and some financial return.

The projects defined as successful had all the indicators, whereas the unsuccessful projects had few or none. The eight key factors common to successful projects were:

1. Link to economic performance or industry value
2. Technical and organizational infrastructure
3. Standard, flexible knowledge structure
4. Knowledge-friendly culture
5. Clear purpose and language
6. Change in motivational practices
7. Multiple channels for knowledge transfer
8. Senior management support

The authors suggested that successful KM projects require more fundamental behavioral shifts than most other change efforts. The complexity of human factors to be managed is much greater than it is for most data on information management projects. Unlike data, knowledge is created invisibly in the human brain and only the right organizational climate can persuade people to create, reveal, share, and use it.

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Davenport, T. H., & Klahr, P. (1998). Managing customer support knowledge. *California Management Review*, *40*(3), 195–208.

The authors pointed out that customer support managers have been generally unaware that they were explicitly engaged in KM. Instead, their focus has been on solving very significant business problems and using customer support for retaining and expanding market share. This article described why managing customer support knowledge is important, and gave several examples of clear benefits achieved.

Companies can and do use customer support as a means of differentiating their offerings from the competition's. Support knowledge, which is

critical to frontline staff, includes known customer problems and solutions, customer inquiries and answers, and customer product questions and recommendations. Benefits achieved by using knowledge management techniques to capture support knowledge include the following:

1. Improved quality of solutions delivered to the customer: providing high-quality technical expertise and best practices to the company's nontechnical frontline staff and in many cases directly to the customer.

2. Established consistency: providing the correct solutions consistently for the same types of problems.

3. Increased first-call resolutions: enabling the frontline staff to answer more of the calls the first time, without the need to escalate to technical experts.

4. Reduced cost per call: resulting from more rapid problem resolution and use of less expensive personnel.

5. Reduced calls to a support desk: getting it right the first time reduces repeat calls.

6. Reduced field service costs: solving problems remotely can cut down on technical field visits.

7. More customer-oriented frontline staff: resulting from better leverage of technical skills on new product development and allowing frontline activity to focus on customer interaction and relationship building.

8. Accelerated training: accessing knowledge becomes part of everyone's job.

9. Increased staff satisfaction: resulting from allowing frontline staff to solve more problems independently and gain confidence in their abilities to do so.

10. Increased customer satisfaction: giving customers answers faster and with a higher degree of accuracy.

The knowledge-sharing model is now expanding outward, toward sharing knowledge with the customer. Knowledge is now made directly available to customers on-line in modes ranging from simple listings of *frequently asked questions* to repositories containing solutions to thousands of issues. When customer support knowledge can be made sufficiently generic for a large market, it is being packaged and sold by third-party companies.

Customer support KM is different from other forms of KM because it derives from so many different sources, comes from many different media, and is applied to so many different purposes. Customer support knowledge is both broad and deep. Because of these characteristics, *case-based reasoning* (CBR) has become the most common technology for problem resolution in

the customer support environment. CBR is a method for representing past situations (*cases*) and retrieving similar cases when a new problem is encountered. Problems not in the database of cases represent opportunities to improve the knowledge repository. The limitation of CBR is that analysts with expertise in case development must review and edit submissions to ensure quality. However, there is an emerging technology using an automated case generator.

The chain of customer support knowledge ideally includes first, the case base, then a company intranet, and finally the Internet. The big challenge in supporting KM is integrating the technologies to create a seamless support environment that is also synchronized with cost databases. Customer support knowledge managers are ideally experienced cross-functional people and are able to handle the political sensitivity of product or service failings. The ability to deal with frustrated and disgruntled customers as well as translate product jargon into real-world solutions is a highly valued skill.

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Davenport, T. H., & Prusak, L. (1998). *Working knowledge: How organizations manage what they know*. Boston: Harvard Business School Press, 178 pages.

The focus of this book was on how knowledge that is embedded in routines and practices can be transferred into valuable products and services. The nine chapters dealt with knowledge markets and knowledge generation and transfer. The book also explored the roles and skills involved in KM as well as the technologies. The authors shared several types of KM projects: knowledge repositories projects, knowledge access and transfer projects, and knowledge environment projects.

They asserted that success in KM projects is measured primarily through the following attributes: growth in resources attached to the project, growth in the volume of knowledge content and usage, recognition of the project as an organizational initiative, comfort throughout the organization with the concept of KM, and some evidence of financial return.

The authors also identified nine factors common to successful projects: a knowledge-oriented culture, a technical and organizational infrastructure, senior management support, a link to economic or industry value, a modicum of process orientation, clarity of vision and language, nontrivial motivational aids, some level of knowledge structure, and multiple channels for knowledge transfer.

It was pointed out that KM should start with a recognized business problem that relates to knowledge, such as the loss of key personnel. Then a

hard look at the organization's culture is necessary before deciding the foundation on which to have a KM effort. This is because it is much harder to get organizational consensus for behavioral change and new roles than it is to get consensus on new technology.

The basic premise of this book was that data, information, and knowledge are not interchangeable concepts. Data are found in records, but the value of information depends on a receiver's perception of it. Further, knowledge is obtained from individuals and their experience.

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Dixon, N. (2000). *Common knowledge: How companies thrive by sharing what they know*. Boston: Harvard Business School Press, 240 pages.

Only recently have organizations begun to construct processes around knowledge sharing. Technology has been of assistance, but there is still a great requirement for tools and processes that can bring about the transfer of knowledge.

Dixon argued that creating successful knowledge transfer systems requires matching the type of knowledge to the method best suited for transferring it effectively. Having taken an in-depth look at five organizations (Ernst & Young, Ford, Chevron, Bechtel, and British Petroleum) that are leading the field in collecting, storing, disseminating, and reusing organizational knowledge, the author revealed insights into how organizational knowledge is created and how it can be effectively shared—and why transfer systems work when they do.

Until now, most organizations have had to rely on costly trial and error to find a knowledge transfer system that works for them. Dixon outlined three criteria that must be considered in order to determine how a transfer method will work in a specific situation: the type of knowledge, the nature of the task, and who the receiver of that knowledge will be. She also explored three "myths" about knowledge sharing, because many organizations started with one or more of these ideas and then had to make corrections to get back on track. The myths are (1) build it and they will come, (2) technology can replace face-to-face interaction, and (3) first create a learning culture.

Dixon distilled five distinct categories of knowledge transfer and explained the principles that make each of them work so that managers can determine the systems that would be most effective in their organizations. Going beyond one-size-fits-all approaches and simple generalities, like upper-management involvement and the need to address cultural issues, this book is useful to organizations that wish to construct knowledge transfer systems tailored to their unique form of common knowledge.

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Drucker, P. F. (1998). The coming of the new organization. In *Harvard Business Review on knowledge management* (pp. 1–19). Boston: Harvard Business School Press, 224 pages.

Drucker projected what the characteristics of typical business organizations will look like twenty years from now. They will have half the levels of management and one-third the managers of their counterparts today. He pointed to contemporary information-based organizations, such as hospitals and symphony orchestras, to illustrate how information-based organizations will work. He saw a greater use of specialists and a management structure that works with task forces.

In information-based organizations, knowledge will be primarily at the "bottom," or in the minds of specialists who direct themselves, based perhaps on their relationships with customers. He gave an example of this in the transformation of research departments that are being replaced by cross-functional teams that are responsible for the entire developmental cycle from product or service inception to establishment in the market.

Information-based organizations do require clear, simple, common objectives that translate into particular actions. The other requirement is that everyone takes information responsibility by asking, "Who in this organization depends on me for what information?" and, "On whom, in turn, do I depend?" In organizations where this happens effectively, MIS departments will become results centers rather than cost centers.

The new organization managers will be task force leaders. But there will also be a need for ensuring the supply, preparation, and testing of top-management people. Their task is to give the organization of specialists a common vision, a view of the whole. The entire top-management preparation process will become even more problematic than it is now, because various schools will need to work out what successful professional specialists must know and be able to do to function as executives and leaders.

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Durrance, B. (1998, December). Some explicit thoughts on tacit learning. *Training & Development*, pp. 24–29.

Durrance wrote that Western culture loves explicit knowledge; that is, knowledge that is quantifiable, such as definable information in reports, memos, manuals, and so forth. Tacit knowledge is more mysterious and harder to talk about. It lives in our hunches, intuition, and values. Tacit knowledge is formed in relationships, the deep physical and emotional

knowing that grows as a result of working alongside one other. Moreover, the depth and range of tacit knowledge to that of explicit knowledge is what the proverbial iceberg is to the tip.

The author suggested that sometimes experiential courses are the best way to reveal tacit knowledge. Group exercises serve as a metaphor for the workplace. Once given a task and set of instructions and parameters, people will use their own predispositions in working with each other. True workplace behavior surfaces quickly. Participants can then recognize and make explicit in a safe context what confronts them every day. Physical metaphors carried out in the tacit domain provide deeper learning than do exercises carried out solely on the intellectual plane. The natural place where knowledge resides is in an individual, and companies have to do something to connect that to organizational knowledge.

An example was given of the Smart Services project created at the Xerox Palo Alto Research Center (PARC). A PARC study found that Xerox engineers, who make more than a million customer calls a month worldwide, tell war stories to each other about diagnosing and fixing machines. Xerox recognized that manuals and training programs can't keep up with the fast-paced change of hardware and that the most current know-how is in the heads and hands of the service technicians. So they created a program to facilitate and support the sharing of these stories among peers. They put together a relational database with a hypertext-based format for capturing tips and processes for validating and distributing them. Trust is a subtle but key factor in the success of this project in which individual knowledge is converted to organizational knowledge; now the project handles over 5,000 tips a month.

The concept of tacit knowledge was created by Michael Polanyi, who said we know more than we can ever say. The Institute for Research on Learning in Menlo Park, California, studies making tacit knowledge visible—that is, ways of talking, being, dealing with things; style; culture; and so forth. For example, the researchers observe how members of a group handle a difficult customer, how a team puts together a solution, or how people simply walk through a hall. The purpose of studying these patterns of behavior is to align what people are doing and where the company is headed.

Groupware is another way to allow people to play around with ideas in a virtual space, without the social and emotional barriers of conventional exchange. Use of groupware requires communicating ahead of time what will happen to the data that are created. The conversion from tacit to explicit is a deeply personal activity possible only in a atmosphere of trust and respect.

The greatest support managers can give to this process comes from who they are and what they do, not what they say.

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Fahey, L., & Prusak, L. (1998). The eleven deadliest sins of knowledge management. *California Management Review*, *40*(3), 265–276.

Fahey and Prusak identified eleven pervasive errors associated with the ways knowledge is understood in organizational settings and the problems that can occur when these errors are unresolved. The errors are

1. not having a working definition of knowledge,
2. emphasizing knowledge stock to the detriment of knowledge flow,
3. viewing knowledge as existing mostly outside the actual individual,
4. not understanding that a fundamental intermediate purpose of managing knowledge is to create shared context,
5. paying little heed to the role and importance of tacit knowledge,
6. disentangling knowledge from its uses,
7. downplaying thinking and reasoning,
8. focusing on the past and the present and not the future,
9. failing to recognize the importance of experimentation,
10. substituting technological context for human interface, and
11. seeking to develop direct measures of knowledge.

The authors outlined three sets of actions that managers can take to avoid these errors.

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Finnerty, P. (1998). Knowledge management made easier. *CMA Magazine*, *72*(2), 31.

Finnerty asserted that there are three factors that will determine the success or failure of any KM system. The first component is timeliness, that is, delivering information only when it is needed. This can provide the same benefits as just-in-time manufacturing processes. The next factor is relevance. This refers to matching the information to the individuals who need it. Push-technology tools can be used by end-users to fine-tune their own browser software programs, for example. The final element is completeness. This focuses on adopting high-level detail to meet the knowledge requirements of target users. Examples are given of techniques used to assist in delivering appropriate data completeness.

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Geraint, J. (1998). People management. *Information Strategy, 4*(16), 44–47.

The author reviewed an issue of *Information Strategy* magazine that included a series of articles critical of consultants, information technology people, and academics doing KM work. He contended that the real problem is that too much faith has been invested in technology at the expense of people issues. Despite all the talk about capturing tacit knowledge, most activity has focused on improving access to basic information such as telephone numbers, product and customer details, and similar sorts of data.

Geraint argued that good information management on this level is unlikely to give significant competitive advantage. What really matters is getting employees to share their insights and experiences so projects can be completed faster and more cost effectively. Rather than trying to capture some vast database of what the organization thinks people might want to know, the emphasis should be on connecting people within communities of practice.

Despite their people emphasis, the author noted that human resources functions are not likely to be involved in KM. A survey by KPMG Consulting found that only 7 percent of knowledge initiatives were led by human resources departments. The most common explanation for the profession's lack of involvement is its lack of comfort with technology. However, if KM is not to suffer the fate of previous initiatives, human resources professionals will need to ensure that the cultural issues are addressed.

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Germeraad, P., & Morrison, L. (1998). How Avery-Dennison manages its intellectual assets. *Research-Technology Management, 41*(6), 36–43.

This article described what happened when Avery Dennison integrated the management of its business development and intellectual property areas, and described how this action provided the ability to turn knowledge into protected profits faster (Avery Dennison is a $3.3 billion company with success from new products and global expansion).

The company identified a strong relationship between strategic planning on one hand and product development and extracting value from intellectual assets on the other. Side-by-side tools were created for both new business and intellectual property. Following is a brief description of the tools:

1. The first tool is used to capture ideas as intellectual assets.

2. The second tool helps strategic planning teams screen ideas for inclusion in the research and development portfolio.

3. The third tool uses knowledge of intellectual property opportunities to prioritize the programs during development.

4. The fourth tool is used to ensure just-in-time intellectual property protection.

5. The fifth tool helps to determine what type of intellectual property protection is most appropriate to use as an idea goes commercial.

6. The sixth tool is used by the firm to audit entire families of developing and maturing intellectual property for their continuing value to the corporation.

7. The seventh tool is used by top management to communicate strong and weak areas of core competency protection.

Avery Dennison continues to find methodologies for extracting value from intellectual assets. This has saved fifty-five minutes per patent application and approximately 10 percent in patent prosecution fees through allowing earlier decisions to abandon technologies that no longer fit corporate strategy.

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Glasser, P. (1998). The knowledge factor. *CIO, 12*(6), 108–118.

The author discussed why KM is a foundation of organic companies, what the obstacles are to KM, and how companies evaluate knowledge.

Although knowledge is the most important asset in any company, there is still much ambiguity surrounding how to manage something that cannot be quantified, let alone universally defined. A 1997 report from the Ernst & Young Center for Business Innovation revealed that 94 percent of 431 organizations surveyed in Europe and the United States have executives who believe "it would be possible, through more deliberate management, to leverage the knowledge existing in [their organizations] to a higher degree." Four areas were discussed that present challenges in any KM effort: (1) changing the culture, (2) evaluating knowledge, (3) processing knowledge, and (4) acting on knowledge.

According to Ernst & Young, 56 percent of executives identify "changing people's behaviors" as the greatest single obstacle to KM initiatives. So any KM effort has to make sharing knowledge profitable, for the company and for the employee.

Evaluating KM is barely in its infancy. Asking questions such as, Who is using the information? Are they decision-makers? and so forth is a way to begin this process.

The author asserted that companies engaging in KM initiatives need to emphasize the human elements. They should think of themselves as in the "human processing" business, not the "information processing" business.

To succeed in effectively managing knowledge, companies have to incorporate KM completely into their cultural fabric, a shift that requires changes in both organizational and personal philosophies. Those changes are more profound than any state-of-the-art information technology system can hope to deliver.

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Glazer, R. (1998). Measuring the knower: Towards a theory of knowledge equity. *California Management Review*, *40*(3), 175–195.

The author contended that no real progress can be made in our efforts to treat knowledge as a variable to be researched or as an asset to be managed unless we come to terms with the issue of measurement, or valuation. This article addressed issues surrounding measurement of the tacit, or subjective, attributes of *knowers*—that is, the information processor. It deals with measuring the meaning of a piece of information.

This approach is in contrast to traditional measurement theory, which works to remove the knower from the process. Measuring the knower involves incorporating context and subjective interpretation (traditionally the domain of the soft sciences). The term knower can also apply to the organization as a whole. The author discussed several factors that knowers pay attention to in processing information: context framing (problem representation), configurable effects, fuzzy aspects of data, dynamics and temporal context, and network externals.

He also asserted that knowers attend to properties of data that conventional measurement methods do not incorporate. That is why it is important to introduce the tacit attributes of knowers into formal measurement methods. It is precisely the ability to pay attention to these properties of data that often results in superior learning.

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Grayson, J., Jr., & O'Dell, C. S. (1998). Mining your hidden resources. *Across the Board*, *35*(4), 23–28.

The authors discussed the importance of KM by using findings from a study of nearly 100 organizations conducted by the American Productivity & Quality Center (APQC) over the last three years. They defined knowledge as "what people in an organization know about customers, products, processes,

mistakes, and successes." KM is "using this information to accomplish the organization's mission."

Knowledge management, they wrote, includes not only explicit (codifiable) knowledge, which is easily captured in documents or data banks, but perhaps more important, tacit (noncodifiable) knowledge, which can account for as much as 80 percent of an organization's valuable knowledge.

This tacit knowledge resides in the minds of people and is based on experience: their lessons grouped as one body of experience, rules of thumb, intuition and judgment, and know-how. A few organizations are already implementing a strategy of helping people share and put knowledge into action by creating access, context, infrastructure, and learning cycles. The authors stressed the importance of understanding what knowledge is important to your organization, then creating processes to put KM into action. They described four "organizational enablers" that surround and help (or hinder) the KM process:

1. Leadership: Senior management should define what knowledge they think is valuable and where they think the organization is missing the boat. At Sequent Computers, a systems integration company, for example, senior executives were asked to "map the revenue value chain" (the key processes that made Sequent money) and then identify where there were gaps that better knowledge could fill.

2. Culture: Some cultures are just naturally supportive of KM. But if an organization is not so fortunate as to start with a supportive culture, it must make a concerted effort to create one, or risk failure. For example, Price Waterhouse, which once based promotions on seniority and personal success (which often meant hoarding, not sharing, knowledge), now includes ratings of "knowledge sharing behavior" in its performance appraisal system.

3. Technology: It's important to understand the limitations as well as the power of technology. It makes connection for knowledge sharing possible but does not make it happen. Knowledge management tools should be embedded in work itself and help people achieve work objectives. Creating additional work with onerous and tedious documentation tasks should be avoided.

4. Measurement: The APQC study, which looked at most of the leaders in KM, has not found measurement of benefits and results of KM per se to be prevalent in the firms studied. Many of the companies, in fact, believed that trying to measure before you understand how KM is working in your organization may cause you to focus on and reward the wrong things. They believe that it is more important to measure the success of the projects and business

processes that are being improved and let the users evaluate the contribution of KM.

APQC found that even though every organization it has studied approaches KM somewhat differently, the most successful use one or more of these five value propositions to guide their strategy:

1. Knowledge as a product: organizing and selling knowledge as a product; packaging it, marketing it, and managing it, just as one would any physical product.

2. Transfer of knowledge and best practices: the systematic transferring of best practices and knowledge from one part of the organization to another part, where they will be used to improve operations or products and services.

3. Customer-focused knowledge: capturing and using knowledge about customers' needs, preferences, and businesses to increase sales.

4. Personal responsibility for knowledge: being driven by the belief that people are the engine of knowledge and should be supported and held personally responsible for identifying, maintaining, and expanding their own knowledge. Used by firms that want frontline service employees to have the knowledge they need to effectively handle customer inquiries, complaints, and unmet needs, this view holds that employees are responsible for their own growth, and the employer is responsible for providing the opportunity to grow.

5. Intellectual asset-management strategy: emphasizing enterprise-level management of specific intellectual assets such as patents, technologies, and operational and management practices.

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Hansen, M. (1998). Knowledge management: The well-connected business. *Harvard Business Review*, *76*(4), 17–21.

Often the most important factor in managing knowledge is the way a company organizes its units and people. Human traits, not electronic ones, are the key.

The author studied the way business units are linked in several large companies. By examining the web of relationships among units—who talked to whom, how often, and about what—he found that the way a unit is linked to others had a dramatic effect on its performance. Differences in performance were traced to two factors: (1) a unit's centrality in the corporate network and (2) the types of relationships it maintained with other units.

Centrality in the overall network was found to be more important than the number of direct relationships. To optimize the flow of knowledge it is

important to ensure that the units one is connected with are themselves well connected. The idea is to build even wider networks. If one thinks only about direct links to expertise, it is possible to overlook a wider web of connected experts.

The author described a process for computing a centrality score: the lower the score the more central the unit is in the overall network; the higher the score, the more isolated. He found a correlation between a unit's centrality and its performance in bringing new products to market. The most isolated teams took an average of twenty months to complete a project; whereas the most central teams took only twelve months. Therefore, it may be possible to get products to market much faster by organizing units into an optimal network structure.

In addition, the types of relationships a unit maintains with other units are critical to its effectiveness. Because they are so different, tacit knowledge and explicit knowledge require very different kinds of transfer mechanisms. Tacit knowledge requires a great deal of face-to-face contact—meetings, training sessions, and apprenticeships. The exchange of explicit knowledge can be completed through electronic means—where knowledge is explicit, weak links will do. If a company tries to use a weak link such as an intranet database to exchange complex, tacit knowledge, it will likely fail. Electronic connections are fast but don't allow interaction and interpretation. Trying to exchange explicit information through a strong link is equally unsuccessful—explicit information requires the ability to search quickly in a lot of places. E-mail is ideal, but strong links, such as meetings, are not efficient.

The author asserted that the implications are great for productivity. Where units were exchanging explicit knowledge, those with weak links (e-mail) completed their projects 25 percent faster than those with strong links. Where tacit knowledge was exchanged, however, units with weak links were at a clear disadvantage; they took 20 percent longer to complete projects than did units with strong links.

Given the impact a network's structure appears to have on performance, executives need to take a proactive role in shaping knowledge networks.

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Hansen, M. T., Nohria, N., & Tierney, T. (1999, March-April). What's your strategy for managing knowledge? *Harvard Business Review*, pp. 106–116.

Because KM as a conscious practice is young, professionals lack models to use as guides. This article reported on a study of KM practices at management consulting firms, health care providers, and computer manufac-

turers. The authors found two very different kinds of KM strategies, each of which is described in detail in the article.

The first kind is a *codification strategy*, in which the strategy centers on the computer. The emphasis here is on replicating knowledge by making it widely accessible. The rise of networked computers has made it possible to codify, store, and share certain kinds of knowledge more easily and more cheaply than ever before.

The other kind of strategy is closely tied to the person who developed it, and it is shared mainly through direct person-to-person contacts. In this approach, *personalized strategy*, the chief purpose of computers is to help people communicate knowledge, not store it.

The authors believed that a company's KM strategy should reflect its competitive strategy: how it creates value for its customers, how that value supports an economic model, and how the company's people deliver on the value and the economics.

The value proposition for a codification strategy is that it be of high quality, be reliable, and allow for fast reuse of codified knowledge. This allows firms to invest once in a knowledge asset and reuse it many times. In contrast the value proposition for the personalization strategy is to turn individual expertise into highly customized solutions to unique problems.

On one hand companies that follow a codification strategy rely on the economics of reuse; they save work, reduce communications costs, and can take on a greater quantity of projects more quickly. On the other hand, companies that follow a personalization strategy can charge much higher prices because their staff must function as inventors tackling unique problems. These differences apply also to the health care industry, as the authors showed by contrasting the reuse of codified knowledge by Access Health Inc., a call-in medical center whose information system employs algorithms of the symptoms of more than 500 illnesses, with the personalization model used at Memorial Sloan-Kettering Cancer Center in New York.

The authors recommended an 80/20 split in use of the two strategies: 80 percent KM with the predominant strategy and 20 percent with the secondary strategy in support of the first one. Firms that try to excel at both strategies risk failing at both. This effort also confuses the staffing strategy because one approach requires implementers and the other inventors. The right strategy choice comes from understanding why customers buy the firm's products or services. The authors offer several questions to ask that help determine this.

Finally, they suggested that isolating KM in human resources or information technology departments risks losing the benefit of strategic coordina-

tion. Knowledge management strategy must be the conscious choice of a CEO or general manager and must clearly support the competitive strategy of the organization. When leaders fail to make such a choice, customers may end up paying for a customized solution when a standard solution would have worked perfectly well. Or they may get a standard solution when they really need help with a unique problem. Either way, everybody loses.

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Hargadon, A. B. (1998). Firms as knowledge brokers: Lessons in pursuing continuous innovation. *California Management Review*, *40*(3), 209–228.

This article summarized the findings of a three-year study of eight knowledge-brokering organizations that have been successful at pursuing continuous innovation. The intent was to understand how the developmental process occurred in organizations when their primary job was to innovate.

Knowledge brokers engaged in a few simple yet very interdependent activities that enabled them to consistently innovate:

1. Access to a wide range of industries: Knowledge brokers profit by transferring ideas from where they are known to where they represent innovative new possibilities. This also applies within internal divisions of large firms where lack of communication creates gaps in the firm's knowledge. Whether across divisions or across industries, access to a number of otherwise disconnected knowledge domains provide the initial conditions for innovation through knowledge brokering.

2. Learning: Organizations that learn can use knowledge of existing problems and solutions at a later time; learning also creates an inventory of valuable ideas of requisite variety.

3. Linking: Individuals facing novel problems can find solutions by using analogies to highlight nonobvious similarities between two things that appear dissimilar. (Many attempts to capture and codify knowledge fail because they choke the process of analogical thinking.) The knowledge-brokering application of linking can find the obscure connections between current and past problems.

4. Implementation: To succeed, knowledge brokers combine the ideas they bring to an industry with the existing and well-developed ideas in that industry. This learning-by-doing approach also further builds the organization's knowledge base for use in later projects.

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Hibbard, J. (1997, October 20). Knowing what we know. *Information Week*, pp. 46–54.

There are two main factors behind the newfound interest in KM, according to Hibbard. The first is the expansion within technological fields. The second is the many recent mergers and acquisitions, which leave companies with uncertainty and an overload of information. Because KM is an important resource for survival, companies need to become involved with it.

There is no universal definition to work with, but there is a distinction between two types of knowledge. One is explicit and the other is tacit. These terms were coined by Nonaka and Takeuchi, two professors in the knowledge field.

The creation of knowledge and how it's being applied by different companies was investigated. Several managers warn that no one of the technologies being employed by these companies is enough by itself. Using a few technologies together offers a better chance that the necessary knowledge will be gathered and used. There are nine of these technologies, as identified by Monsanto, a St. Louis chemical corporation that has reorganized itself and integrated KM. They are groupware, messaging, Web browsers, document management, search and retrieval, data mining, visualization, push technology, and intelligent agents.

Some new categories of KM specific products were also discussed.

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Hildebrand, C. (1995). Knowledge management: Experts for hire. *CIO Magazine*, *8*(13), 32–40.

In the business rush to find ways in which to manage knowledge, companies are turning to other organizations that specialize in the gathering and distribution of knowledge. This article reported on one such organization: Teltech Resource Network Corporation. According to Joseph Shuster, developer of the *knowledge commons* on which Teltech is founded, "the company is based on a combination of interactive human services, technical search tools, and a comprehensive knowledge of human information-gathering behaviors into a knowledge management environment." Several researchers and knowledge activists praise Teltech's endeavors. Examples and an interpretation of these procedures were given. The key is the mixture of human and machine resources on which Teltech draws. For today's company, Teltech offers five different KM services: (1) the expert network database, (2) assisted database searches, (3) vendor services, (4) the knowledge management service, and (5) the technical alert service.

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Holtshouse, D. (1998). Knowledge research issues. *California Management Review*, *40*(3), 277–281.

The author suggested three areas of priority for research and experimentation if the knowledge field is to move forward:

1. Research on the ways tacit knowledge can continue to be tapped and utilized despite increasing economic and business forces that are disrupting the social context of the workplace community where tacit knowledge lives and thrives: Research is needed to determine the cultural and work practice changes that must be undertaken to create an alternative environment for co-creation that is exciting and exhilarating to work in and still provides the support needed for an ideal knowledge-creating environment.

2. Research on how to optimally structure knowledge flow between knowledge seekers and knowledge providers to maximize the impact of knowledge: In order for this flow to work effectively, the system must continually learn the usage and communication patterns of both seekers and providers; these may be expressed through work practice profiles at both the individual and the community level.

3. Research on ways to make knowledge—which by its nature is fuzzy and intangible—visible and concrete.

The author also asserted that for collective work to succeed organizations especially need to make visible business processes that cross functional and organizational boundaries, knowledge that affects relationships with customers, knowledge that affects alliances with vendors and suppliers, knowledge flow networks that wind through and across organizations, overall business knowledge creation and expansion rates versus those of competitors, the optimum knowledge intensity level in products and services, and the effect of the *knowledge factor* in business models and value chains.

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Jones, P., & Jordon, J. (1998). Knowledge orientations and team effectiveness. *International Journal of Technology Management*, *16*(1-3), 152–160.

There are several factors that make the search for knowledge essential to surviving in today's market, for example, downsizing and continually changing technology. One enterprise that is faced with both these circumstances is the aerospace industry. The industry became the focus of a study by the authors to discover how knowledge is utilized in an everyday matter, and that work was documented in this article.

Twenty-four engineers in the field were interviewed. Four different issues were the basis of these interview questions: (1) "What kinds of knowledge are important in doing your job?" (2) "How do you acquire that knowledge?" (3) "How do you retain/store that knowledge?" (4) "How do you share that knowledge with others who need access to it?"

One conclusion was that the usable knowledge was found in the head of the individual, not in paper or computer form. From this and other findings, it seems apparent that it might not be possible to develop one way of gathering, storing, and disseminating necessary knowledge. The authors noted that this was a small-scale study, which limited its effectiveness.

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Junnarkar, B. (1997). Leveraging collective intellect by building organizational capabilities. *Expert Systems with Applications, 13*(1), 29.

This author examined the emerging field of KM through the following steps: First, he offered a short historical perspective on how *information technology* (IT) has affected the way we work. Second, he presented a value-creation model. Third, he explored how information and knowledge creation and learning play critical roles in generating insight. Fourth, an organizational strategy to add value was explained. Fifth, a KM methodology was presented. Sixth, he suggested how KM should be approached within an organization. Seventh, he described how KM evolved at Monsanto Company.

On the topic of people and IT, the author described a variety of tools, emphasizing that people are drowning in a sea of information but that these same people are starved of knowledge. The ability to make sense of growing amounts of information is a significant restraint. It will be necessary in the future to recognize patterns as they emerge and to make sense of trends more rapidly in order to compete successfully. The value creation model proposed emphasizes an organization's ability to take information, convert it into insight, and use that insight to add value. This insight comes from across all functions and must be discovered in the aggregate.

The author regarded knowledge creation as the way to leverage the collective intellect of people in the organization. He further described KM as connecting people with people as well as connecting people with information.

He made a specific point of contrasting people and computers as sense makers, saying that people can make almost complete sense out of incomplete information, but computers need mostly complete information to make partial sense. From this, he constructed a two-axis matrix with clarity of understanding on one axis and completeness of information on the other. He also con-

trasted mature concepts, which are high on both axes and easily replicated in the marketplace, to emergent knowledge, which relies on subjective judgment but has more competitive advantage. The field of IT tends to move people toward obtaining complete information rather than toward gaining clarity of understanding with available information. But complex, incomplete, and timely information, together with people who can interpret and make sense out of it, will be what gives companies significant competitive advantage.

The skills required for sense making are quite different from the skills required to manage mature concepts. Project management skills that drive operational excellence are important for managing mature concepts. But generative learning techniques are characteristic of people who operate successfully in low completeness of information and low clarity of understanding contexts.

Effective knowledge communities require that organizational values be aligned well with individual values. Knowledge communities thrive because of the human network, not the IT network. A KM initiative can begin with the following steps: (1) integrate information from all sources, (2) create multiple pathways to making connections, and (3) exploit every possible way of making connections.

The author also discussed several kinds of maps. A *learning map* is a visual depiction of the business model; a *values map* can serve as the basis for creating appropriate knowledge communities; and *knowledge maps* identify the interactions of various people.

He concluded by describing the four different types of knowledge transfer: explicit to tacit, explicit to explicit, tacit to tacit, and tacit to explicit. He points out that all these transfer processes are interactive. Knowledge management, if practiced appropriately, will strike the right level of symbiosis between people, information, and IT.

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Kelly, K. (1998). *New rules for the new economy*. New York: Viking Penguin, 172 pages.

The author presented convincing evidence that business roles of the past no longer apply. He described ten new, powerful laws that are becoming part of the new global economy. These new rules apply to all businesses, not just high-tech industry. There are ten chapters in the book, each devoted to one of the rules.

The first rule, "embrace the swarm," is about the power of decentralization when computer chips are embedded in all objects. Although these chips

are dumb parts, known as *jelly beans*, a planet covered with hyperlinked chips, properly connected, yields smart results.

The second rule, "increasing returns," is about the exponential increases that result from organic networks.

The third rule is that value flows from abundance—"plenitude, not scarcity." This means that open systems are rewarded more than closed systems because they increase the number of potential relationships; out of relationships come products, services, and intangibles.

The fourth rule is "follow the free," which means that demand increases as supply increases. This is in contrast to earlier and opposite laws of supply and demand. So the most powerful question to ask is, What can be given away?

The fifth rule is "feed the web first." This means that both individuals and firms compete not by locking in a product on their own but by building webs of loose alliances with other companies. To raise your product, lift the networks it ties into. Because information trumps mass, all commerce migrates to the network economy.

The sixth rule is "let go at the top." This applies because of the suffocating inertia of getting stuck on past successes and because of the prediction that nine times out of ten your fiercest competitor will come from outside your field.

The seventh rule is "from places to spaces," which states simply that geography is dead. The business value chain is a linear concept; the chain will become a value web made up of conceptual market space.

The eighth rule is "no harmony, all flux." This means that outside the core of values, nothing should be exempt from change.

The ninth rule, "relationship technology," says that the internal economic imperative of the network economy is to amplify relationships. The correct notion is not technology managing information but technology as a medium for relationships. For example, instead of a firm capturing as much information about the customer as it can, it wants customers to capture as much information about themselves as they can. The network economy starts with chips and ends with trust.

The final rule is "opportunities before efficiencies." This is about the power of combined explosives; this means that doing the exactly right next thing is far more fruitful than doing the same thing better.

This book also stressed pools of knowledge versus pools of capital and emphasizes the change to an open society; the future is about networks, large, wide, deep, and fast.

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Knapp, E. A. (1998). Knowledge management. *Business and Economic Review*, *44*(4), 3–6.

This article briefly described the reasons for implementing a KM program and then showed how these programs are being utilized. The first half revolved around the benefits of a properly aligned program, such as limiting the loss of information and knowledge after someone else leaves. The next portion was devoted to the necessary components of a successful project. These include content, learning, culture, measurement, and technology.

The article concluded by looking at several specific organizations and then introducing four characteristics they have in common: ubiquity, speed, virtual communities of practice, and business without boundaries.

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Krogh, G. V. (1998). Care in knowledge creation. *California Management Review*, *40*(3), 133–153.

Krogh claimed that a company's success depends not only on gaining access to individual and team knowledge of the corporation but also on how well the company turns this knowledge into "value-creating activities." Value is created through five phases of the creation of new knowledge. For these phases to be successful, managers must both understand KM and be sensitive to their company environment.

First, Krogh put forth two perspectives of knowledge: the *cognitivist* perspective (explicit knowledge) and the *constructionist* perspective (tacit knowledge). This is relevant because successful knowledge creation projects include both perspectives, not just the former.

Next, he touched on four barriers to the justification of these projects. When these can be overcome, or at least identified, the company's level of care needs to be assessed. The environment that individuals work in is critical to how well the KM process will be applied and utilized. For example, if individuals feel the only reason they are there is for their special knowledge, they won't share with other individuals. A manager needs to implement a high level of care.

There are several things any company can do to expedite care. The first is a system that allows people to seek help and sincerely encourages it. Another is a program that encourages older or senior members to mentor junior ones. This encourages growth and improvement across the board. The culture must also foster trust, openness, and courage, as modeled by top-

management officials. This process is continued through training programs that show how care is implemented and encouraged. Debriefings at the end of these projects are also essential to their success. This is a learning and questioning time that shows participants that a learning environment is actually encouraged.

Finally, outside activities that are not work related foster this care-driven atmosphere. This is all demonstrated in a brief case study of Unilever, a consumer products company.

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Leonard, D. (1997). Building and sustaining the sources of innovation: An interview with Dorothy Leonard. *Strategy and Leadership*, *25*(4), 22–27.

Leonard is a knowledge researcher and a professor of business at Harvard University. Through her studies, she has found that only the organization that can create, channel, and use its information will survive. This is because information leads directly to innovation. But this knowledge management cannot be accomplished successfully without certain core capabilities from the organization itself.

These capabilities can be both the physical and intangible assets of a corporation. But if they become stagnant or unchanging, they are then core rigidities, which hinder the growth of the process. Leonard also deciphered the difference between information and knowledge, with knowledge containing three different segments: (1) generation, (2) integration, and (3) leveraging. It is necessary to be certain that all these are included when integrating a KM process.

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Leonard, D., & Sensiper, S. (1998). The role of tacit knowledge in group innovation. *California Management Review*, *40*(3), 112–132.

Tacit knowledge is the personal, hard-to-capture aspect of knowledge. The authors of this article put forward the fact that innovation is usually accomplished in groups. It is creativity in groups that is essential to the ascertaining of a new idea or product. This group endeavor is also one of the areas that most needs tacit knowledge; however, most research has been done on individual knowledge alone. The studies documented in this article focus on creativity and tacit knowledge as it is shared in groups for the purpose of discovering a new idea or product. Three ways tacit knowledge is utilized in the creation of innovation were discussed: problem solving, problem finding, and prediction.

The innovation process itself was also examined. The first aspect of the process is that it is cyclical rather than linear. This means that creativity is necessary throughout the process, not just at the beginning.

Divergence also occurs, meaning that each person has at least one *deep skill*. These individuals then converge as tacit knowledge is generated then shared. But the authors showed that there are several barriers to this process. With managerial help, tacit knowledge can be used to facilitate and enhance the innovation process.

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Leonard-Barton, D. (1998). *Wellsprings of knowledge: Building and sustaining the sources of innovation*. Boston: Harvard Business School Press, 334 pages.

The author looked at the process of managing a company's knowledge assets within the context of the development of new products and processes. Each chapter contains case histories of successes and failures drawn from the experiences of a number of technology-based companies in various manufacturing industries.

The book is divided into three parts. Part 1, "The Nature of Core Capabilities and Rigidities," presents the conceptual frameworks and suggests a central dilemma—the idea that *core capabilities* are simultaneously *core rigidities*. In order to help make the abstract more concrete, real-life situations of particular companies are discussed.

Part 2, "Key Innovation Activities," focuses on four activities that the author asserts create flows of knowledge and direct them into the core capabilities. Extensive field studies are used to describe and illustrate these four activities, which are (1) integrated problem solving across different cognitive and functional barriers, (2) implementation of new methodologies and process tools, (3) experimentation, and (4) importation of know-how from outside technological and market sources. The author maintained that the management of these activities distinguishes organizations that learn from those that do not learn.

Part 3, "Growth and Renewal," discusses the development of core technological capabilities in global companies and concludes with a brief summary of some general characteristics of organizations and managers who engender, nurture, discipline, and encourage technological knowledge—those who do a good job of creating core technological capabilities.

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Liebowitz, J. (Ed.). (1999). *Knowledge management handbook*. Boca Raton, FL: CRC Press, 288 pages.

This handbook collected essays from practitioners and researchers as a means of formulating methodologies, techniques, and practices for creating value from an organization's intangible assets.

The first section dealt with KM and strategy and is based on the premise that KM should be viewed as an integral part of a firm's strategic business initiatives. Through this integration of KM, the ongoing strategic objectives, core competencies, and employer capabilities will be transformed, and the performance of the organization will be noticeably improved.

But specific connections between KM strategies and organizational performance are difficult to establish in practice. The aspects of strategy to which KM can be tied are generally not financial goals but, rather, high-level operational strategies. For example, an emphasis on operational excellence or product innovation or customer intimacy has new implications in terms of KM and the kind of information valued most highly.

The second section of the handbook dealt with people and measures. The evidence from early adopters of the KM concept is that as in all radical approaches, mistakes and failures have occurred along the way. These have generally been a result of concentrating too much on the technical and process aspects of KM rather than on culture and people. KM is 80 percent about people and cultural change. Processes, infrastructure, management style, and organizational values are all part of culture. It is the job of executives to integrate the hard and soft elements while focusing on the end result. The focus on learning as a driver of change has in many ways overlapped with KM initiatives.

Approximately one-fifth of Fortune 500 companies employ someone who, in role if not in name, is a chief knowledge officer; these executives are sometimes called chief learning officer, director of strategy, or futurist-in-chief.

KM is a change program. It involves changing the culture, which in turn requires an alteration in the way people work, a reexamination of expressed and perceived values, the creation of psychological space in which to interact, a focus on individual and corporate learning, an assessment of business processes and structures, and an evaluation of reward and motivation systems.

Many organizations are leveraging the contribution of the traditional library and information management skills by integrating them into the business and adding additional skills to the team. The virtual library or distributed information approach is overtaking the concept of the central

information department. Information specialists are now found in core business teams, in business development functions such as competitive intelligence, and in the development programs of the government, health care, and not-for-profit sectors.

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Maggie, M. (1999, April). Is knowledge management the future of HR? *KM World*, pp. 58–60.

The human resources community is astounded by the amount of executive interest in the emerging discipline of KM. The author described senior managers' interest in developing ways to implement knowledge-sharing programs that provide sustainable competitive advantage.

Also, KM has emerged as a key lever in strategic planning. Just as KM has provided a quantifiable method of measuring the contribution of information technology to the entire organization, it is apparent that human resources professionals play an equal if not more important role in designing a system to share employee knowledge. Human resources managers who realize the value of KM can provide the cultural direction needed to ensure success.

A critical factor in developing the type of knowledge transfer that will put an organization ahead of the competition is the ability to convince employees to share their expertise. That is emerging as human resources' most important function.

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Malhotra, Y. (1998). Deciphering the knowledge management hype. *Journal for Quality and Participation*, *21*(4), 58–60.

Malhotra asserted that the biggest competitive advantage lies in knowledge creation. This skill has become essential in an age that has moved from slow, predictable change to a fast-moving, adapting environment. The only way to accomplish knowledge creation is to share collective knowledge, then act upon it. Because the business environment is consistently changing, stored, stagnant information will no longer give a company the competitive edge it needs to survive. In this article, Malhotra examined the difference between information and knowledge and discussed why the latter is necessary.

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Marshall, C., Prusak, L., & Shpilberg, D. (1998). Financial risk and the need for superior knowledge management. *California Management Review, 38*(3), 77–101.

Although this article began by discussing risk management and why it fails, the authors focused on KM as one of the keys to solving the problems risk management faces. Three different organizations that have recently failed at risk management were examined. One problem discussed was that traditional organizations are looking for a quick fix whereas KM takes longer but yields a much bigger payoff. Tacit knowledge, rather than explicit knowledge, is also shown to be beneficial to corporations. The culture or environment of the business and its relation to KM was also examined.

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Miles, G., Miles, R. E., Perrone, V., & Edfvinsson, L. (1998). Some conceptual and research barriers to the utilization of knowledge. *California Management Review, 40*(3), 281–289.

Knowledge management was discussed in view of the managerial approaches rooted in twentieth century mind-sets and methods. Three areas require particular attention:

1. "Seeing conceptual knowledge as the central organization asset": Although the primary challenge for organizations has always been accumulation and application of knowledge to create economic value, the role of knowledge today is more central and pervasive. Yet there is little recognition of this role either in legal structures guiding corporate governance or in basic tools, ratios, and measures.

2. "Incorporating knowledge capital into the strategic management process": To allow for planning and investment in knowledge, a new way of conceptualizing capital is needed. Examples might include social capital or returns from value-adding distribution networks.

3. "Designing organizations to facilitate knowledge utilization": Although organizations are primarily hierarchical, the development, dissemination, and use of knowledge is horizontal; what's more, it tends to resist efforts aimed at direct control and manipulation. What is needed are processes that encourage the flow and transfer of knowledge, as well as an infrastructure within which the creation of knowledge can occur.

The authors contended that at its heart, knowledge utilization is a collaborative process. This process is neither the maximization of individual utility nor a communal system that destroys motivation. Rather, collaboration entails individual efforts voluntarily combined to produce outcomes that individuals would not achieve alone.

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Nonaka, I. (1998). The knowledge creating company. In *Harvard Business Review on knowledge management* (pp. 21–45). Boston: Harvard Business School Publishing, 224 pages.

Creating new knowledge is not simply a matter of mechanistically processing objective information. It depends on tapping the tacit and highly subjective insights, intuitions, and ideals of employees. This process is in opposition to the deeply ingrained view of Western management, which values only formal and systematic quantifiable data. But the key metrics for measuring the value of new knowledge are similarly quantifiable—increased efficiency, lower costs, and improved return on investment and time.

In the knowledge-creating company, inventing new knowledge is not a specialized activity, that is, the province of the research and development department. Making personal knowledge available to others takes place continuously and at all levels of the organization. Tacit knowledge is highly personal and deeply rooted in action. It also has an important cognitive dimension and consists of mental models, beliefs, and perspectives so ingrained that we take them for granted and cannot easily articulate them.

Nonaka described each kind of knowledge transfer: tacit to tacit, tacit to explicit, explicit to tacit, and explicit to explicit. In the knowledge-creating company, all four of these patterns exist in dynamic interaction. He gave special attention to the use of metaphors, symbolism, and figurative language to convert tacit into explicit knowledge, and gave examples from the Honda Motor Company and Canon.

The author stressed the value of redundancy—the conscious overlapping of company information, business activities, and managerial responsibilities. It is important because it encourages frequent dialogue and creates common cognitive understanding. If employees share overlapping information, they can sense what others are struggling to articulate. Free access to company information also helps build redundancy. Teams play a central role because they provide shared contexts and dialogue—team members can pool their information and examine an issue from different angles.

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Nonaka, I., & Konno, N. (1998). The concept of *ba*: Building a foundation for knowledge creation. *California Management Review, 40*(3), 40–54.

The authors introduced the Japanese concept of *ba* and presented their adaptation of the concept to elaborate their model of knowledge creation. *Ba*,

which is roughly equivalent to *place* in English, is a shared space for emerging relationships.

The space can be physical (for example, an office or dispersed business space), virtual (e-mail or teleconference), mental (shared experiences, ideas, or ideals), or any combination of these three. The authors consider ba to be a shared space that serves as a foundation for knowledge creation. They divided knowledge into two categories: (1) explicit (that which can be expressed in words and numbers and shared, for example, as data), which has generally been emphasized in the West, and (2) tacit (that which is highly personal and hard to formalize, for example, subjective insights, intuitions, and hunches), which is the way many Japanese view knowledge. Tacit knowledge, they suggested, has two dimensions: (1) the technical dimension (often referred to as know-how), and (2) the cognitive dimension (beliefs, ideals, values, schemata, and mental models), which shapes the way we perceive the world.

Nonaka and Konno contended that knowledge creation is "a spiraling process of interactions between explicit and tacit knowledge." They presented the SECI (socialization, externalization, combination, and internalization) model as an outline for knowledge creation. In socialization, tacit knowledge is exchanged between individuals through joint activities rather than through written or verbal instructions. Externalization involves articulating tacit knowledge of customers or experts in forms that can be understood by others. The combination process involves converting explicit knowledge (for example, public data) into more complex sets of explicit knowledge (for example, plans, reports, or market data). The internalization of newly created knowledge, they suggested, is the conversion of explicit knowledge into the organization's tacit knowledge.

Next, the authors presented four types of ba that correspond to the four stages of the SECI model. *Originating ba* is the stage in which individuals share feelings, emotions, experiences, and mental models. Care, love, trust, and commitment emerge from originating ba, which represents the socialization phase. *Interacting ba* is the stage in which tacit knowledge is made explicit, so it represents the externalization process. *Cyber ba*, a place of interaction in a virtual world instead of real space and time, represents the combination phase. The internalization phase is supported by *exercising ba*, which facilitates the conversion of explicit knowledge to tacit knowledge.

The authors included case studies of three companies that employ ba on the team (Sharp), division (Toshiba), and corporate (Maekawa) level. They asserted that a different sort of leadership is required for managing emergent

knowledge in ba, and emphasized that top managers must realize that knowledge needs to be nurtured, supported, enhanced, and cared for.

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Nurmi, R. (1998). Knowledge-intensive firms. *Business Horizons*, *41*(3), 26–32.

Nurmi contended that the one difference between knowledge-intensive firms and traditional industrial-manufacturing firms is that the former are less "capital-intensive" and more "teaming-intensive" than their industrial counterparts. To demonstrate this difference, Nurmi examined the similarities among knowledge-intensive firms, then contrasted these firms with the industrial firms. One of the similarities is that knowledge firms take the extra step from data and information to learning and wisdom.

A knowledge-intensive firm is also resource based. In a knowledge-intensive firm, knowledge is looked at not as a product, such as a physical good given to a customer, but as a potential asset. The structure is also set up very differently than it is in traditional firms. Although traditional firms have both a horizontal and vertical flow, knowledge-intensive firms all but eliminate the vertical layer. The layout of the horizontal flow is also different. Other differences between the two types of firms were also discussed. These differences include the entire makeup and culture of the firm. Nurmi cautioned the reader to remember that although the distinctions between the two types of firms are very clear, there are no perfect distinctions in the everyday world.

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O'Dell, C., & Grayson, C. J., Jr. (1998). *If only we knew what we know: The transfer of internal knowledge and best practice*. New York: Free Press, 226 pages.

The American Productivity & Quality Center (APQC) is a nonprofit source of information and knowledge that brings together consortia of organizations to find best practices. This book documented some of these efforts. In 1994, APQC completed a research study regarding the phases and barriers to effective transfer of knowledge. The findings were that even in the best of firms, in-house best practices took an average of twenty-seven months to move from one part of the organization to another. This book was about learning to manage this transfer of knowledge by looking at case studies. The results of four major consortium benchmarking studies on KM were shared. The studies concerned Buckman Laboratories, Texas Instruments, the World Bank, and Sequent Computers.

The book was divided into six parts: a framework for knowledge transfer, some proposed value propositions, the enablers of transfer, reports on the case studies, a four-phase process for knowledge transfer, and principles the authors have derived from their work. These principles, with some examples of each, are as follows:

1. Business values drive transfer benefits: Improving customer-related practices, speeding up product development, or achieving new levels of operational excellence are "value levers."

2. Transfer of best practices is the most common, and most effective, KM strategy: It is the most popular way companies chose to find out and share what they know.

3. KM must be woven into the corporate infrastructure: To work, KM must be a part of everyone's agenda and not one person's job.

4. Funding earmarked for KM is rare: Funding for specific projects and approaches usually resides in the information technology department and the business units that have a project champion.

5. Having the right culture is critical: Indicators of this culture are a strong professional ethic, corporate pride, or well-honed team skills

6. Successful KM efforts employ a "push-me-pull-you" approach: Push is about capturing knowledge in a central repository, and pull is about people seeking the knowledge they need when they need it.

7. If KM works, it really works: If you make sure KM helps people do their jobs better and faster, they will share.

8. Top-level support is a must. This support can be gained by demonstrating success early on or by presenting a clear and compelling case for the action.

9. Technology is a catalyst but no panacea: Information technology is seen as enabling, however.

10. Mature KM efforts lead to a transition from nurturing to measuring: Early KM efforts have been characterized by experimentation and trial and error, but there is now a search for sophisticated yardsticks.

The appendix contained the knowledge management assessment tool (KMAT). It was jointly developed by APQC and Arthur Andersen in 1995 to help organizations assess their KM strengths and opportunities.

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Pemberton, M. (1997). Chief knowledge officer: The climax to your career? *Records Management Quarterly*, *31*(2), 66–69.

This article examined KM from the point of view of the new position of CKO, or chief knowledge officer. It not only gave a good description of the

job but also laid out exactly why the CKO is needed in the KM realm. The article presented several examples of well-known corporations, such as Coca-Cola, that have used CKOs.

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Peppers, D., Rogers, M., & Dorf, B. (1999, Jan.-Feb.). Is your company ready for one-to-one marketing? *Harvard Business Review*, pp. 151–160.

This article described *relational marketing* or *customer relationship management*. The authors defined relational marketing as based on a learning relationship with the customer that gets smarter with each interaction. Thus the management of customer relationship knowledge is a core component because it is critical to know customers in as much detail as possible.

Ultimately, to lock a customer into a learning relationship a company must adapt some aspect of its behavior to meet the individual customer's expressed needs. This individual treatment is based on what has been learned about the customer from any point of contact—sales, marketing, or any other department. The authors posed four questions that could guide companies contemplating a relational marketing initiative:

1. How well can your company identify its end-user customers?

2. Can your company differentiate its customers based on their value or on their needs?

3. How well does your company interact with its customers?

4. How well does your company customize its products or services based on what it knows about its customers?

An example used in the article was Amazon.com, where a knowledge approach includes keeping track of customer tastes and preferences in reading material. As a result, the authors concluded, it will always be a little easier for the customer to find a book at Amazon.com than to go someplace else and explain preferences anew. This is one reason that 59 percent of Amazon.com's sales come from repeat customers—twice the rate of retail bricks-and-mortar bookstores.

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Powell, W. W. (1998). Learning from collaboration: Knowledge and networks in the biotechnology and pharmaceutical industries. *California Management Review*, *40*(3), 228–240.

Powell asserted that rather than relying solely on internal knowledge, companies are turning toward one another to accomplish what cannot be done alone. Collaboration has several benefits: first, collaboration raises entry costs for potential competitors; second, it quickens the rate of technological innova-

tion; third, it has the potential to have transformative effects on the firms involved; and finally, it can increase competitive advantage by forcing other companies to initiate the same practices.

The authors discussed how collaborative networks work, and they explored the routes for networks' emergence. As the skills of relationship contracting become embedded in organizational routines, firms increase their learning capacity. Informal seminars on lessons learned from a partnership are particularly helpful when staff from multiple functions are involved. With wider diffusion and with reflection and interpretation, information is "thickened" into knowledge.

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Quinn, J. B. (1992). *Intelligent enterprise*. New York: Free Press, 473 pages.

The author gave examples of what organizations would look like if they weren't defined by industry-specific descriptions but as packages of interdependent services. For instance, some companies have taken internal staff services and turned them into solid lines of business (Federal Express manages logistics for Laura Ashley, for example). These examples are intended to provide insight into the basic function of organizations as they move into the future—especially the management of intellect.

With a premise that the management of services, service technologies, and human intellect is the primary determinant of business success, the author provided research and statistical evidence to support his claims. Also, the book contained data from over 100 interviews with CEOs, CIOs, and other operating managers. The author's research over a ten-year period revealed that the development and use of technology for services, whether in service industries or manufacturing, is the key to future wealth and productivity.

This book represented continuing study on the interaction among service technologies, economics, strategy, and organizational theory. It dealt with the key concept of breaking up corporate activities into manageable intellectual clusters or service activities. This concept is based on the author's premise that intellect is the core resource in producing and delivering services. He pointed out that service industries account for 74 percent of the gross national product and 77 percent of all jobs. This trend is continuing because of the emergence of intellect and technology as the most highly leveraged assets. For example, the manufacturing-services interface is now the key to most manufacturing strategies.

The service industries include transportation, communications, financial services, wholesale and retail trade, most utilities, professional services,

entertainment, health care delivery in the private sector, and government social services in the public sector.

There are four myths about services which were exposed and explained:

1. The lower value misconception regards services as somehow less important than products. But the author argued that products are only physical embodiments for the services they deliver. For example, an automobile delivers flexible transportation or a personal image, both services.

2. The low capital intensity perception asserts that service industries are much less capital intensive and technological than manufacturing. But data reveal that the total capital investment per information worker in service industries now exceeds that for workers in basic industrial activities.

3. The misconception about small scale views the service sector as too small and diffuse to buy major technological systems. But in fact, large banks, airlines, utilities, financial services institutions, communication companies, hospitals, hotels, and so forth now have the scale to be lead purchasers of technology. Many large service institutions also support extensive research and development activities—examples include Bell Labs, Federal Express, Arthur Andersen, Citicorp, and Microsoft.

4. That services cannot provide wealth is a myth based on the view that wealth has been the hallmark of the industrial era, based on productivity increasing through automation in manufacturing. Although productivity in services is harder to measure, the sales value of the service can provide a measurable output.

On the whole, service technologies have begun to cause the *remanufacturing* of the U.S. economy. As all services have grown on the basis of their improved technologies over the past several decades, they have enhanced both the standard of living and the outreach of U.S. companies. Being able to scan and produce for consumer demand is the sign of success in the new services society.

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Ruggles, R. (1998). The state of the notion: Knowledge management in practice. *California Management Review*, *40*(3), 80–89.

Ruggles examined a past study of 431 U.S. and European companies (performed by the Ernst & Young Center for Business Innovation) to see what these companies are doing to manage their knowledge, what they want to do or believe that they should do, and what barriers they are facing.

First, it was discovered that there are eight categories of knowledge-focused activities, but they are not managed as processes by themselves. Rather, companies try to improve in these areas by using specific projects.

The four most popular of these projects are (1) creating an intranet, (2) data warehousing, or creating knowledge repositories, (3) implementing decision-support tools, and (4) implementing groupware. Looking at these projects, it becomes apparent that companies are focusing on technology. Although in and of itself this is not a problem, Ruggles showed three things companies need to keep in mind. The first is to map internal expertise. This means gaining knowledge straight from the source, the mind of the individual who possesses it. This is extremely useful in cases where knowledge cannot yet be codified. The next is to create networks of knowledge workers. This enables people to build on each other's expertise. The final step is to establish new knowledge roles, such as a chief knowledge officer. All of these actions encourage the use of tacit knowledge, which can be lost in simple technological projects.

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Ruggles, R. L. (Ed.). (1997). *Knowledge management tools*. Newton, MA: Butterworth-Heinemann, 295 pages.

The author is a research leader at Ernst & Young's Center for Business Innovation. This book is an edited version of 16 essays about various KM tools. He introduced his topic by saying that true competitive advantage lies in leveraging the unique, powerful knowledge of the organization. He described the three main activities in KM as generation, codification, and transfer. This book is one in a series about knowledge, and it draws on sociology, economics, computer science, and cognitive psychology to discuss KM tools.

Part 1 described KM in a technological context, beginning with how computers are organized and ranging all the way to artificial intelligence software.

Part 2 focused on KM generation as it affects creativity and how human capacity may be increased by our environmental context.

Part 3 dealt with KM codification and the structure of knowledge itself. The author drew distinctions between *symbol knowledge* (extrinsic), *embedded knowledge* (kinesthetic), *embrained knowledge* (central nervous system), and *encultured knowledge* (tacit).

Part 4 talked about knowledge transfer and discussed a variety of collaborative tools, which use shared "mind space," interpersonal computing, and visual-mapping techniques. Various kinds of knowledge-capture labs were discussed as well as ways in which to create computer-based knowledge synthesis or synthesized experiences.

Part 5 was about implementation. It described modes of user involvement in the interaction between people and technology. It was noted that the greatest competitive advantage came from a process of mutual adaptation. Groupware was discussed, and it was emphasized that groupware products must be grounded in shared norms to be of maximum effectiveness. Corporate culture provides the framework in which data become meaningful.

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Rumizen, M. C. (1998). Report on the second comparative study of knowledge creation conference. *Journal of Knowledge Management, 2*(1), 77–81.

This report was from a June 1998 conference of academics and practitioners in St. Gallen, Switzerland. The conference highlighted knowledge creation models and practices. Case studies were presented by Unilever, Daimler-Benz, and Gemini Consulting. Major themes included managing knowledge in a supply-chain context, boundaries in supply networks, and self-organizing links in supply-chain management.

The role of leadership is to provide answers to the question, What kind of knowledge and skills do we have to develop? Leadership is also critical to alignment, making sure that rewards, roles, mind-set, and structure are aligned with the knowledge strategy. Despite the heightened quality and breadth of the presentations and discussions, the author reported that much work remains to be done in the field of KM. At the time of publication, she herself was working in the KM field at Buckman Laboratories in Memphis, Tennessee.

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Skyrme, D. J., & Amidon, D. M. (1998). New measures of success. *Journal of Business Strategy, 19*(1), 20–24.

The authors began this article with the three reasons why organizations want to measure their knowledge assets. First, it provides a foundation for company valuation. Also, and equally important, it focuses management attention on what is relevant. Last, it becomes a justification for investing in KM activities.

Different types of knowledge were then identified. The list was pulled from the Hawley Report, which was compiled from thirty major organizations "dedicated to the sharing of practical experience and knowledge about information management."

The authors then focused on three types of tools for facilitating KM. These are the Balanced Scorecard, the Scandia Navigator, and economic

value added. The first of these, created by Robert S. Kaplan and David P. Norton, asserts that there are four perspectives that must be examined, not just financial concerns. The Scandia Navigator, created by the company of the same name, looks at consistent behaviors as well as financial performance. The final measurement, developed by Stern Stewart Consulting, works most closely with issues of finance. This perspective takes the operating profit then subtracts the cost of the capital.

Finally, six ways that knowledge adds value to any company were shared. The authors noted that measurements need not only be retrospective but can be, and should be, utilized before, during, and after implementation of KM.

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Stephenson, K. (1995). The formation and incorporation of virtual entrepreneurial groups. *Entrepreneurship Theory and Practice*, *19*(3), 35–45.

This article used an anthropological framework to describe virtual entrepreneurial groups in an organization. The setting is a high-tech computer software company where the author was a visiting anthropologist for two years. She described how an entrepreneurial group emerged within the organization and developed in an ad hoc manner.

The case study dealt with the formation of a consulting business (known as CCS) within the framework of a traditional hierarchical organization producing only products. The author pointed out that CCS represented not only a different way of thinking about a product but a different way of communicating as well. It meant that the typical transaction of a product sale to a customer was rethought and transformed into a continuing consulting relationship of service to the customer. The business question was whether consulting relationships could be developed into professional consulting services that were commercially profitable for the corporation. But the operational question was whether individuals within the organization would communicate and share knowledge sufficiently across department boundaries to integrate an essentially new function into the overall work flow.

From this study the author explored how networks of work relationships that span specific boundaries may be evidence of entrepreneurial activity. She pointed out that very little is understood about the invisible communication patterns that link parts of an organization with each other. However, she believed there may be distinctive communication patterns associated with entrepreneurial activity.

A developmental model was presented. The first stage represents how new ideas are often met with skepticism; this, however, is an important stage in most novel situations.

In the second stage, informal groups coalesce around specific projects or tasks. However, in this firm the middle managers involved were limited in what they could do outside their assigned and familiar lines of authority and responsibility. These lines of authority were embedded in a traditional manufacturing paradigm. It was only with the appointment of a vice presidential sponsor and an official budget that CCS was effectively transformed from informal group to fully mature division of the company.

The third stage represents strong leadership and canonization of a corporate strategy. With progression through this final stage, the virtual group is assimilated into the hierarchy.

Prior to completion of all three stages, virtual groups are easy targets for attack. To shield against this, they span hierarchical boundaries through networking. This activity stands in stark contrast to the intragroup communication patterns found in the majority of departments in an organization.

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Stewart, T. A. (1998, Nov. 9). Packaging what you know. *Fortune*, pp. 253–254.

The author made the point that knowledge management, by itself, is not the key to company strategy and that knowledge must also be embedded in the products. For example, in the professional field of law, even though a client is paying for legal knowledge, he is buying much more. A lawyer is also selling his negotiating ability, his relationships with other lawyers, and his knowledge of the client's priorities. Other examples cited included Buckman Laboratories, a chemical company, which also "packages" and sells its knowledge of chemistry. Lotus Corporation now gets more than 20 percent of its revenue from selling technical support services, training, and consulting along with its software.

Stewart mentioned the work of Richard Wang of MIT, who offers four principles for managing information products:

1. Understand consumers' information needs.
2. Create a well-defined production process.
3. Stay on top of the life cycle of information products.
4. Appoint a product manager.

By adding customer knowledge to a product, an organization makes the knowledge-management process complete.

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Svelby, K. E. (1997). *The new organizational wealth: Managing and measuring knowledge-based assets*. San Francisco: Berrett-Koehler, 275 pages.

The author pointed out that business school does not prepare managers for work in the world of nontangible assets. Yet managers learn to pay closer attention to their intangible, knowledge-based assets. As proof, Svelby stated that he has found that managers in the fastest growing, most profitable businesses focus on knowledge; see their businesses from a knowledge perspective; and act as if their intangible assets are real assets. He identified some KM skills and also outlined ways to measure intangible assets.

The key activity in knowledge organizations is transferring knowledge. The author referred to a basic concept in KM literature, that knowledge is created by the interactions of explicit and tacit knowledge. He stated that leaders in successful knowledge organizations are high in both professional and organizational competence—this means that leaders demonstrate professional expertise in their industry as well as experienced management insight and practices. Leaders who are not experts in the profession of their business may make important decisions, but the experts in the company may not heed them. An effectively leaderless knowledge organization can often be identified by the degree of negative strains in its culture—for example, the exodus of managers or disgruntled support staff. In contrast, successfully run knowledge organizations reflect deeply committed people.

Internal structures such as patents, concepts, models, and administrative systems that support the professionals who are involved in knowledge creation processes with customers are key to the flow of knowledge within an organization. Knowledge-focused strategy creates a relationship with the customer that is very different from the relationship resulting from an information-focused strategy. The KM approach is not to "sell" to customers but to volunteer knowledge and entertain the relationships so that customers want to return. This approach entails creating information-sharing systems and publicizing concepts.

The last section of the book dealt with measuring intangible assets. The author said most companies measure at least some of their intangible assets and use nonfinancial indicators for measuring operational efficiency, or effectiveness of the internal structure. The problem with measuring intangibles is that outcomes are difficult to interpret—the results of customer surveys are a good example. Other measurement approaches address employee competence and growth and renewal on individual and organizational

levels. Several case studies are presented of companies that have implemented measuring systems for their intangible assets.

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Teece, D. J. (1998). Capturing value from knowledge assets: The new economy, markets for know-how, and intangible assets. *California Management Review*, *40*(3), 55–79.

The author stated that managing intellectual capital in the information age can be described as a new epoch. He described this new context that encompasses markets, trade, patents, and the flow of goods and services. Tangible competence was contrasted with know-how assets that cannot be readily bought or sold.

Implications of this dramatic change for firms were discussed in detail. The essence of the firm becomes its ability to create, transfer, assemble, integrate, and exploit knowledge assets. Knowledge assets underpin competencies, and competencies in turn underpin products and services in the market.

The goal of leaders should be to develop organizational structures capable of shaping and reshaping clusters of assets in the distinct and unique combinations needed to serve ever-changing customer needs. These structures should be strongly influenced, not by boundary issues and transaction cost considerations alone but by tacit knowledge and imitation or replication considerations.

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Teece, D. J. (1998). Research directions for knowledge management. *California Management Review*, *40*(3), 289–293.

Teece maintained that because KM is still a fairly new concept, or at least new to the level of interest it is receiving, scholars have an obligation to not only preserve but also add to current literature. Researchers still need to engage in the following activities:

1. Assemble evidence to test the proposition that firm-level competitive advantage in open economics flows fundamentally from difficult-to-replicate knowledge assets: Accomplishing this task means establishing measures for intangible assets as well as for dynamic capabilities.

2. Make a greater effort to quantify the value of intangible assets: In particular, technological know-how, brands, and customer relationships should appear on adjusted balance sheets.

3. Understand generic inputs, idiosyncratic inputs, and profitability: Value flows from a profitable business model supported by intangible assets and business processes with a high tacit component.

4. Confirm that more entrepreneurial firms are likely to favor investment in innovative activities, though not necessarily through centralized research and research-development efforts, and that they are also likely to be characterized by a changing kaleidoscope of alliances and joint ventures.

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Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. New York: Cambridge University Press, 318 pages.

This book is part of a series by Cambridge University Press on studies of learning and cognition. It put an emphasis on interdisciplinary syntheses among the fields of anthropology; cognitive, developmental, and cultural psychology; computer science; education; and social theory.

The social theory of learning, which is the foundation for this book, was described as theory and in practice. In particular, the author put a primary emphasis on learning as social participation and also explored and explained the *communities of practice* in which learning occurs. In organizations this means that learning is an issue of sustaining the interconnected communities of practice through which the organization becomes effective and valuable.

Information stored in explicit ways, for instance in a database or as codified knowledge, is only a small part of knowing. Knowing primarily involves active participation in social communities. If, for example, one believes that productive people in organizations are the diligent implementers of organizational processes, then the key to organizational performance is the definition of increasingly more efficient and detailed processes by which people's activities are prescribed. It would then make sense to engineer and reengineer these processes in abstract ways and roll them out for implementation.

But if one believes that people in organizations contribute by participating inventively in practices that can never be fully captured by institutionalized processes, then prescription should be minimized. Organizations should be contexts in which communities that develop inventive practices can prosper.

Part 1 of the book defined the concept of practice and the kind of social communities that practice defines. The basic aspects of practice are: the social production of meaning, the building of a source of coherence in a community, and the learning process. Social connections link communities of practice with the rest of the social configuration as one or more than one larger community.

Communities of practice are organizational assets because they are the social fabric of the learning within organizations. Aligning learning with the

goal of an organization depends on the allegiance of participants; this allegiance depends in turn on those communities of practice, which constitute the individual's identity. The author contended that the kinds of personal investment and social energy required for creative work are not a matter of institutionalized compliance. They are a matter of energizing the identities of participants. By offering an institutional home to communities of practice that are key to its competence, an organization helps sustain the kind of identity that allows participants to take active responsibility for aspects of organizational learning.

Because communities of practice are not formal entities, they are a resource that is easily overlooked. In some cases it is precisely their ability to cross institutional lines that makes them crucial.

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Section 2: What Is Knowledge Management?

There are three areas of content drawn from the works annotated here that can address the question, What is knowledge management? Those areas cover the working understandings of KM, the differences between explicit versus tacit knowledge, and some organizational examples that convey the way KM is used.

Working Understandings

Most people understand KM through the technical processes associated with it rather than as a process involving people and culture. However, for the purpose of this discussion, a true working understanding acknowledges either directly or indirectly that data are combined with something human and less tangible—perhaps experience or content, interpretation or reflection. Even so, there are almost as many possible ways to understand, and thus define, KM as there are authors cited.

Thus this section presents several KM perspectives that have a human dimension. Some perspectives are comparisons of explicit and tacit information sharing, and others simply lay out a communication continuum from documents on-line to trust. Some involve differing ways to share knowledge with the customer, and others contrast codification with more personalized approaches. But all of these working understandings involve some mixture of humans and machines.

KM is a conscious practice. The current literature describes two distinct kinds of KM practices (Hansen, Nohria, & Tierney, 1999). A *codification strategy* centers on technology to replicate knowledge and make it accessible. This practice is the more prevalent because it deals largely with explicit information and fits well with the technology-based solutions already available.

A *personalized strategy* emphasizes not data storage but communication through individual contacts. It has a much greater reliance on tacit information, which is less readily available. This strategy is concerned primarily with invention, whereas the first strategy is concerned mostly with the reuse of knowledge.

The current KM literature reflects much greater clarity and understanding for using the codification strategy in organizations but also reveals a great need to learn more about using the personalized strategy.

KM is mapping internal expertise. Organizations are keen to more effectively leverage the knowledge existing in their organizations. The

literature says that executives in organizations believe that it's possible to achieve that greater effectiveness with more deliberate management (Glasser, 1998). However, companies have primarily been focusing on technology to achieve KM (Ruggles, 1998). This approach overlooks the need to engage in the complementary activities of mapping internal expertise, creating networks of knowledge workers, and establishing new knowledge roles such as chief knowledge officer. Simple technological projects fall short of meeting these goals.

KM is transferring effectively what you know. Because non-codified knowledge can account for as much as 80 percent of an organization's valuable knowledge, it is logical to assume that the only way to achieve the intended outcomes is to have effective systems for sharing and transferring among employees, customers, vendors, and others. This is especially so if one defines knowledge as what people in an organization know about the company's clients, products, and systems (Grayson & O'Dell, 1998). That definition requires employees to use their knowledge to accomplish the organization's mission.

KM is data, information, and knowledge. One way to begin the process of discernment in regard to knowledge is to understand that data, information, and knowledge are not interchangeable concepts. The term *data* describes a set of discrete, objective facts about events (structured records of transactions). *Information* is a message, usually in the form of a document or communication, the importance of which is decided by the receiver (it might also be defined as data that make a difference to someone). *Knowledge* is a mix of framed experiences, values, contextual information, and expert insights originating in the mind of the knower (Davenport & Prusak, 1998). This last step—achieving insight—is a common thread in most of the understandings covered in this section. Of course, insight is more characteristic of tacit than of explicit knowledge, thus reinforcing the premise that knowledge cannot exist in a very complete form without the addition of humans to the equation.

As in all new approaches, mistakes and failures have occurred along the way in early adoptions of KM. These mistakes have generally been a result of concentrating too much on the technical and process aspects of KM and not enough on culture and people (Liebowitz, 1999). It becomes the job of the executives to integrate the hard and soft elements while focusing on the end result. KM requires a deliberate change program because it involves influencing perceived values, creating psychological space for interaction, focusing

on corporate learning, assessing business processes and structure, and evaluating reward and motivational systems.

Some experts focus on traditional success criteria for knowledge projects, such as relevance of information, timeliness of information delivery, and completeness of information (Finnerty, 1998). These may be necessary, but they are not sufficient criteria for a successful KM project because none of them, separately or in combination, create the needed changes in culture. Some of the mistakes associated with KM include errors associated with misunderstanding the difference between knowledge and information or data (Fahey & Prusak, 1998).

KM management requires an integrated approach. The term KM represents the entire range of KM work, from creating documents on-line to building a culture of trust (Cohen, 1998). This is a big task for a new emerging field, especially one in which organizations have invested so much time and money in all its aspects—except the building of a KM culture. The literature indicates that organizations are developing more insight into how to take a triadic approach, one that can integrate the human, organizational, and technological components of the KM environment. It is this integrated approach that can build a foundation strong enough to endure the tests of time and practice.

Yet integration is easy to aspire to but difficult to deliver. The literature suggests that the most efficacious approach is to create all three systems around customer or relationship management. For example, most businesses today maintain a customer contact database, and there is a wide choice of software available for this purpose. But how many take the next step and use these data to identify those customer segments most aligned with their own mission and values? How many firms connect customer goals and purposes to their own organizational strategy? What about the patterns of communication and the learning practices that exist in the interface between customers and staff? Does a knowledge transfer culture exist in this interaction, and if so, in which direction does knowledge flow, and how do we know?

Explicit Knowledge Versus Tacit Knowledge

This section discusses the differences between explicit and tacit knowledge and examines each one's uses for KM.

Western culture has very successfully handled explicit knowledge—the quantifiable, definable information in manuals, memos, and reports. But we have much more difficulty with tacit knowledge because it comprises hunches, intuition, and values and is formed through relationships (Durrance,

1998). The concept of tacit knowledge was created by Michael Polanyi, and the patterns of behavior that make up tacit knowledge are the subject of much current thinking and study.

Explicit knowledge by itself does not adequately account for the social character of knowledge because knowledge is both produced and held collaboratively (Brown & Duguid, 1998). Also, due to its social origins, knowledge moves differently within communities than between them. Creating the appropriate social context for distributing both kinds of knowledge is a complex but crucial undertaking for organizations.

There are also many current issues and dilemmas surrounding the measurement of tacit knowledge, that is, the subjective attributes of knowers. This is because these forms of measurement, which involve incorporating context and subjective interpretation, are traditionally the domain of the soft sciences and are in stark contrast to traditional measurement theory, which works to remove the knower from the process.

So how and why do organizations use both forms of knowledge to their best advantage? Many are motivated to incorporate both tacit and explicit ways of knowing because either approach by itself is not enough to deal with contemporary problems. More and more companies are now trying to incorporate both in their integration of KM practices: groupware, messaging, Web browsers, document management, search and retrieval, data mining, visualization, push technology, and intelligent agents are just a few examples (Hibbard, 1997).

These organizations find that the biggest advantage in integrating tacit with explicit knowledge is the resulting outcome of knowledge creation. But the only way to accomplish this outcome is to share collective knowledge and then act upon it. Because the business environment is constantly changing, stored, stagnant information will no longer give a company the competitive edge it needs to survive (Malhotra, 1998).

These organizations also are able to distinguish themselves from those that don't engage in KM practices. The difference between knowledge intensive firms and traditional industrial manufacturing firms is that knowledge is viewed not as a product but as a potential asset. Because manufacturing companies now make up less than 18 percent of the companies in the United States, a trend to focus on intellectual property as the primary source of assets is very much in evidence. This will make KM all the more important, and the company that knows how to integrate explicit and tacit knowledge sources will have a clear competitive advantage.

There are also structural differences between knowledge intensive and traditional firms. Although traditional firms have both horizontal and vertical flows of data and information, knowledge intensive firms all but eliminate the vertical layer. The layout of the horizontal flow is also different (Nurmi, 1998).

In a final note on the importance of both explicit and tacit knowledge, it is argued that only the organizations that can create, channel, and use their information will survive. Professor Leonard-Barton (1998) at Harvard Business School contends that using the full spectrum of knowledge, explicit and tacit, is what leads to innovation.

Organizational Examples

A search of the World Wide Web by Thomas Stewart (1998) turned up 26,586 matches for the term KM. He explains that this result is not surprising, given that total spending on information technology is now a greater portion of the U.S. gross domestic product than revenues from the auto industry. There are also a growing number of CKOs (chief knowledge officers) and articles explaining this new role and why it is needed (Pemberton, 1997). This growth suggests that the knowledge officer function must be incorporated either by the CEO or by the executive team, because they are largely responsible for the management of organizational culture. But either way, by function or by role, the management of organizational knowledge has now become an international business, and this exponential growth provides a substantial baseline for the following examples of how organizations are using KM.

Aerospace. A study from the aerospace industry (Jones & Jordon, 1998) of how engineers acquire, retain, and share knowledge found that the most usable forms of knowledge were not in a computer database. This industry example is echoed by the biotechnology and pharmaceutical industries (Powell, 1998), where companies are turning toward one another and using collaborative networks to accelerate knowledge development. The advantages include raising the entry barriers for noncollaborative entities, accelerating technological innovation, and transforming the cultures of the companies themselves. In fact, a firm's portfolio of collaborations and partnerships has become a strong dimension of competition in high-tech industries. Thus a well-integrated definition of KM will expand outward not only toward customers but also toward current and potential partners.

Telecommunications. As businesses rush to find ways to manage knowledge, they are also turning to third-party organizations that specialize in

the gathering and distribution of knowledge. Hildebrand (1995) discusses one provider called Teltech Resource Network Corporation, showing how it supplies not only technical search tools but also assistance in identifying and developing information-sharing behaviors. This example suggests that the key to making KM work may be the right mixture of humans and machines.

Section 3: How to Build a Knowledge-sharing Culture

This section is focused largely on the contexts required for knowledge-sharing systems to function well. The different contexts are described, from individual to group to organization-wide settings. All of them require some participation, however, in a social community. The literature also suggests that the evolution of work practices and the emergence of KM are happening at the same time.

Although the practices for establishing collective intellect are still somewhat rudimentary, many experiments are under way. It is possible that the next few years could bring new ways to measure these emerging work cultures and facilitate our ability to intentionally enhance the culture necessary for productive information behaviors.

The literature yielded three themes regarding knowledge-sharing cultures: frameworks for knowledge transfer, communities of practice, and work practices and outcomes.

Frameworks for Knowledge Transfer

Creating an efficient knowledge-transfer system requires matching the type of knowledge to be shared to the method best suited for transferring it effectively. Until recently, making that match was a costly trial-and-error endeavor. Presently companies are developing and following established criteria in a bid to make the identification and design of a knowledge-transfer system more easily and inexpensively attained. Generally speaking, the criteria focus on the type of knowledge, the nature of the task, and the receiver of the knowledge (Dixon, 2000). Once the criteria have been satisfied, successful knowledge-transfer systems are designed in phases (O'Dell & Grayson, 1998) and take into consideration organizational issues such as culture, funding, and infrastructure, to name a few.

An anthropological framework toward building knowledge systems might look at the invisible communication patterns that link parts of the organization (Stephenson, 1995). It's possible that networks of work relationships that transfer knowledge across boundaries already exist in organizations eager to set up knowledge-transfer systems and that these informal systems are adopted and adapted.

Frameworks for building knowledge-transfer systems can also be developed through challenges and incentives that spark innovation and make the collecting and sharing of knowledge across boundaries necessary. 3M, for example, has exploited a heightened emphasis on innovation (Brand, 1998).

The result motivated disparate 3M groups to explore technologies that created a context for the transfer of knowledge.

Communities of Practice

The basis for the concept of communities of practice is the social theory of learning. Learning can be described as social participation and the means through which the organization becomes effective and valuable (Wenger, 1998). In this view, knowledge primarily involves active participation in social communities. If this premise holds, then to boost performance organizations must furnish contexts within which the communities that develop inventive practices can prosper. This is very different from arguing that people in organizations implement organizational processes and that therefore more efficient and detailed processes prescribing activities boosts organization performance.

Another way to think of communities of practice and their significance to knowledge sharing is to see them as shared spaces for emerging relationships. These spaces form the foundation of knowledge creation (Nonaka & Konno, 1998). The implication here is that a different type of leadership is required for managing emergent knowledge within these shared community spaces. Top managers must realize that knowledge needs to be nurtured, supported, embraced, and cared for.

Because tacit knowledge is the personal, hard-to-capture aspect of knowledge and is also the source of creativity, it makes sense that innovation is usually accomplished in groups. Sharing knowledge is key to that innovation, and groups find ways to use the tacit knowledge of their members within communities of practice to address problem solving, problem finding, and prediction (Leonard & Sensiper, 1998).

A different type of contextual emphasis is evident when geographically different cultures build communities of practice. This is especially evident in differences between Western culture, where the focus is mainly on explicit knowledge and near-term goals, and Eastern culture, where the focus is on tacit knowledge and long-term advantages (Cohen, 1998).

Knowledge brokers that have been successful in creating continuous innovation put an emphasis on a wider concept of community, including cross-industry combinations and nonobvious connections between past and current problems (Hargadon, 1998). This extends communities of practice well beyond organizational boundaries and provides opportunities for significant learning. Good examples of this effect can be seen in the various partnership arrangements that occur in the global business environment. One could

argue that true partnership does not exist without some form of mutual learning that creates new intellectual capital as a result.

It's interesting to consider that more than 90 percent of business-critical systems projects fail (Davenport, 1996). Could it be that these projects have not reached beyond industry or organizational boundaries to build a wider community of practice, one that has the requisite complexity to sustain the project during even the most challenging times?

Work Practices and Outcomes

Despite all the attention being given to sharing tacit knowledge, most knowledge-sharing activity focuses on improving access to basic information such as telephone numbers, schedules, product details, and customer dossiers (Geraint, 1998). This kind of activity can capture a vast database of what organizations think people ought to know but does little to translate cultural issues into work practices. Culture extends beyond the enterprise to include suppliers, customers, competitors, alliance partners, and distributors to create what can be called a strategic business network (Amidon, 1998) that can provide integral links between human potential and economic performance.

For organizations that want quantifiable measurement of knowledge-management efforts, it is possible to use increased efficiency, lower costs, and improved return on investment and time as benchmarks. Inventing new knowledge should take place continuously and at all levels (Nonaka, 1998). It cannot be the unique purview of the research and development department.

A serious KM initiative requires that organizations consider that research on new work practices is as important as research on new products. Research departments must "coproduce" innovation with their ultimate innovation partner—the customer (Brown, 1998).

Work practices can be improved by leveraging the collective intellect. Junnarkar (1997) proposes a value creation model that emphasizes an organization's ability to take information, convert it into insight, and use that insight to add value. This insight comes from across all functions and must be discovered in the aggregate. A KM initiative can begin this process with the following steps: (1) integrate information from all sources, (2) create multiple pathways to making connections, and (3) exploit every possible way of making connections.

Finally, the way a company organizes its units and people can be a very important factor in managing knowledge. The way a unit is linked to others has a dramatic effect on its performance. Centrality in the overall network can be more important than the number of direct relationships. In addition, the

types of relationships a unit maintains with other units are critical to its effectiveness (Hansen, 1998). For example, intranet databases are weak links in that they enable fast connections but don't allow for the interaction and interpretation necessary for exchanging complex, tacit knowledge. Likewise, strong links such as meetings are slow and less efficient than tools such as e-mail for transferring explicit information.

Section 4: Implications for Leadership

KM has implications for a major leadership capacity—value creation. It is not unusual in contemporary business life to see intellectual capital playing an increasingly greater role in the value creation process. In fact, there are numerous examples of companies whose value is 10, 20, or 200 times greater than their revenue in the market. Further, a company's value is no longer determined solely by products. Organizations are becoming less dependent on capitalized value and more dependent on networked relationships. Even in manufacturing environments, three-fourths of the employees actually perform network economy roles such as marketing, design, or intellectual property protection.

Leadership may have no greater responsibility than to grow intellectual assets and facilitate the knowledge necessary for business to thrive. It is highly likely that this knowledge creation process is as much social as it is technical. Thus it may require numerous behavioral shifts so that leaders pay more attention than before to business processes with high tacit components and also identify the structural implications in their organizations.

Because business schools are known for preparing managers to work with more tangible assets, we may see a rise of leaderless knowledge organizations unless the change to a more networked society can fill this gap. Of course, one of the highly valued skills of a leader in this new context will be that of nurturing expanding networks, both in digital and real-time settings.

The literature yielded three topics that apply to KM's implications for leaders: practicing leaders, KM projects and tools, and new roles and structures.

Practicing Leaders

The growing focus on intellectual assets is a major part of the role of practicing leaders. Those leaders have to work systemically to integrate their business development with intellectual property management. Tools such as capturing ideas as intellectual assets, using just-in-time intellectual property protection, and auditing intellectual property for continuing value can serve as methods for extracting value from intellectual assets (Germeraad & Morrison, 1998).

The role of leadership in any organization is to provide answers to the question of what kind of knowledge and skills should be developed. That conclusion can be drawn from observing organizations that manage knowl-

edge within a supply chain context, boundaries in supply networks, and self-organizing links in supply chain management (Rumizen, 1998).

These leadership roles in KM reflect the view that organizations that create value from new products, services, and ideas will prosper. Those that fail to build the intellectual capacity and personal engagement of their members will stagnate. Adopting shared beliefs is essential to the process of knowledge creation as social capital is created simultaneously with intellectual capital. Leaders must attend to social patterns and practices, not just to strategy and technology (Brown, 1999).

Beyond the sharing of knowledge is the question of whether a company can also increase its knowledge through that sharing. Global organizations like Novartis AG understand that making the most of intellectual assets is more of a cultural than a technological challenge (Abramson, 1999). A less hierarchical system for developing intellectual capital is essential to such organizations that depend on innovation to survive.

Approaches to KM that are less hierarchical than traditional management strategies are timely. The spread of knowledge turns upside down the traditional model of policymakers at the apex of the pyramid. In this inverse model, the needed leadership competency is the ability to facilitate two-way conversations. Information is becoming the world's dominant resource, and societies that try to maintain rigid hierarchies will eventually implode (Cleveland, 1997).

Other examples of KM in practice include conceptualizing risk management and investments and managing customer relationships. Taking a long view, KM gives a much bigger payoff than will be achieved by traditional organizations looking for quick fixes (Glazer, 1998). Also, relationship marketing involves a knowledge approach in which customers' tastes and preferences are tracked through a learning relationship with the customer (Peppers, Rogers, & Dorf, 1999).

Knowledge Management Projects and Tools

Some of the newer tools for KM are the Balanced Scorecard, the Scandia Navigator, and economic value added (Skyrme & Amidon, 1998). All of these are promising steps toward measuring knowledge assets, not only because they focus management attention on what is relevant but also because such measures justify investing in KM activities.

Collaborative tools used to share "mind space," interpersonal computing, and visual mapping techniques are helpful in meeting the three main

activities of KM: generation, codification, and transfer. Groupware is especially helpful because of its design around shared norms (Ruggles, 1997).

The components of a successful KM project can include content, learning, culture, measurement, and technology (Knapp, 1998). The degree to which an organization is successful is indicated through such characteristics as a link to economic performance or industry value, technical and organizational infrastructure, a standard and flexible knowledge structure, a knowledge friendly culture, clear purpose and language, a change in motivational practices, multiple channels for knowledge transfer, and senior management support (Davenport, DeLong, & Beers, 1998).

An important conclusion is that successful KM projects require more fundamental behavioral shifts than most other change efforts. If this proves to be an accurate prediction, it means that making KM change efforts work effectively will be an exceedingly difficult challenge for leaders. The research is still very new, and the translation of it into working systems for practicing leaders has barely begun.

Nevertheless, there is a clear responsibility for leaders to create very sophisticated parameters or measures that address the tacit dimension (Teece, 1998). Following are some examples, each of which would very likely require that a marketing R&D function be in place:

1. Assemble evidence to test the proposition that firm-level competitive advantage flows fundamentally from difficult-to-replicate knowledge assets: Although this proposition seems intuitively correct, it requires leadership to identify which assets fit this difficult-to-replicate category and which do not.

2. Make a greater effort to quantify the value of intangible assets: So far, only a few companies have actually included such assets in their annual reports, for example, and only a few have actually translated their intellectual capital into quantitative values (other than market value).

3. Track profitable business models supported by intangible assets and business processes with a high tacit component: This initiative would require substantial insight into which business processes are successful and which are not, to say nothing of the internal politics that such an undertaking would unleash.

4. Confirm that more entrepreneurial firms favor investment in innovative activities, but not necessarily through centralized research and development, and that they are also likely to be characterized by a changing kaleidoscope of alliances and joint ventures: With the business world now being overtaken by these entrepreneurial firms, it seems highly likely that this research could be undertaken successfully.

New Roles and Structures

Because knowledge assets underpin competencies and competencies in turn underpin products and services in the market, the goal of leaders should be to develop organizational structures capable of shaping and reshaping clusters of assets in the distinct combinations needed to meet ever-changing customer needs (Teece, 1998).

But business schools have not prepared managers for working in the area of non-tangible assets. Leaders in successful knowledge organizations are high in both professional and organizational competence (Svelby, 1997). This means that leaders demonstrate professional expertise in their industry as well as experienced management insight and practices. Leaders who are not experts in the profession of their business may make important decisions, but the experts in the company may not heed them. A leaderless knowledge organization can often be identified by the degree of negative strains in the culture—for example, the exodus of managers or disgruntled support staff. In contrast, successfully run knowledge organizations reflect deeply committed people.

Twenty years from now it's suggested that typical business organizations will have half the levels of management and one-third the managers of their current counterparts. There will be a greater use of specialists and a management structure that works with task forces (Drucker, 1998).

Georg von Krogh (1998) points out that the environment that individuals work in is critical to how well the knowledge management process will be applied and utilized. For example, if individuals feel the only reason they are there is for their special knowledge, they won't share with other individuals. Managers need to implement a high level of care. There are several things any company can do to expedite care, the first of which is a system that allows help for individuals and sincerely encourages it. Another is a program that encourages older or senior members to mentor junior ones. This promotes growth and improvement across the board. The culture must also foster trust, openness, and courage through the modeling of such behaviors by top management.

According to Dorothy Leonard-Barton (1998), the process of managing knowledge assets can take an interesting turn because core capabilities (such as problem solving) may be simultaneously core rigidities. What makes the difference is how these activities are framed and the context in which they occur. It is the responsibility of leadership to create flows of knowledge and direct them into the core capabilities through such means as (1) integrated problem solving across different cognitive and functional barriers, (2) imple-

mentation of new methodologies and process tools, (3) frequent experimentation, and (4) importing know-how from outside technological and market sources.

Much of this leadership work requires us to create new contexts, break down organizational boundaries, and encourage a variety of cognitive styles and abilities. All too often leaders nurture only the learning styles similar to their own or restrict the in-house learning environment to exclude potential outside partners with a different perspective. It requires a very self-assured, confident, and probably adventuresome leadership to support good knowledge flow.

It has been reported that the human resources community is astonished by the amount of executive interest in the emerging discipline of KM (Maggie, 1999). The reason is that KM has emerged as a key lever in strategic planning. But a critical competitive factor is still the organization's ability to convince employees to share their expertise. Perhaps this will emerge as one of human resources' most important functions of the future.

Many of our current managerial approaches are still mired in early twentieth-century mind-sets and methods. Some particular areas that might require attention have been identified (Miles, Miles, Perrone, & Edfvinsson, 1998):

1. "Seeing conceptual knowledge as the central organization asset": The message from this is that we must develop agreed-upon ways to recognize conceptual knowledge, and then we can begin to create organizational maps or pictures of where this kind of knowledge resides in individuals and groups as well as in processes and structures. It's possible that the greater portion of it will be found in the interfaces and interactions of internal and external relationships.

2. "Incorporating knowledge capital into the strategic management process": Much strategy work is concerned with moving from point A to point B, and yet the knowledge capital is located at a point yet to be identified, which might be called point C. Therefore, incorporating this knowledge capital means being able to integrate points A and B within the newly identified landscape of point C. This is possible only when the compelling features of the knowledge capital (point C) are clearly identified in the minds and hearts of the executives who set strategy.

3. "Designing organizations to facilitate knowledge utilization": This would be an entirely new set of criteria for organizational structure and roles. However, as more is learned about the personalized, or tacit, aspects of knowledge, it seems entirely possible that knowledge flow requirements

could be matched with interpersonal communication patterns and competencies.

The development and use of technology for services, whether in service industries or manufacturing, is the key to future wealth and productivity. This conclusion is based on the premise that intellect is the core resource in producing and delivering services. Service industries account for at least 74 percent of the gross national product and 77 percent of all jobs (Quinn, 1992). Indeed, service industries have begun to cause the remanufacturing of the U.S. economy.

Business rules of the past no longer apply in the global economy of the twenty-first century. The provocative notion of new rules stresses pools of knowledge versus pools of capital. The future for leadership processes in the knowledge age is about networks—large, wide, deep, and fast (Kelly, 1998). Those networks are brimming with knowledge.

Appendix: Additional Readings and Web Sites

There are many additional valuable resources that have not been selected for review but may be helpful for learning more about the KM field. Some of these are listed here for the reader's consideration. In addition, there are a growing number of excellent Web sites. These provide material from the work of both authors and practitioners, numerous analyses and commentaries, discussion forums, industry case studies, and scholarly research perspectives. Several of the most useful ones are listed below.

Additional Readings

Applehans, W., Glove, A., & Laugero, G. (1998). *Managing knowledge: A practical web-based approach*. Waltham, MA: Addison-Wesley.

Bartlett, C. A., & Ghoshal, S. (1995, May-June). Changing the role of the top management: Beyond systems to people. *Harvard Business Review*, pp. 132–142.

Berger, P. L., & Luckmann, T. (1966). *The social construction of reality*. Garden City, NY: Doubleday.

Boland, R. J., Tenkasi, R. V., & Te'eni, D. (1994). Designing information technology to support distributed cognition. *Organization Science*, *5*(3), 456–475.

Botkin, J. (1999). *Smart business: How knowledge communities can revolutionize your company*. New York: Free Press.

Contada, J. W., & Woods, J. A. (1999). *The knowledge management yearbook*. Boston, MA: Butterworth-Heinemann.

Davenport, T. (1999). *Human capital: What it is and why people invest in it*. San Francisco: Jossey-Bass.

Fiol, C. M. (1994). Consensus, diversity, and learning in organizations. *Organization Science*, *5*(3), 403–420.

Gill, T. G. (1995). High-tech hidebound: Case studies of information technologies that inhibited organizational learning. *Accounting, Management and Information Technologies*, *5*(1), 41–60.

Hamel, G., & Prahalad, C. K. (1994). *Competing for the future*. Boston: Harvard Business School Press.

Handy, C. (1990). *The age of unreason*. Boston: Harvard Business School Press.

Hildebrand, C. (1995). Information mapping: Guiding principles. *CIO*, *8*(18), 60–64.

Huber, G. P. (1984). The nature and design of post-industrial organizations. *Management Science*, *30*(8), 928–951.

Huber, G. P., & Glick, W. H. (1993). *Organizational change and redesign: Ideas and insights for improving performance*. New York: Oxford University Press.

Kerr, S. (1995, Sept.-Oct.). Creating the boundaryless organization: The radical reconstruction of organization capabilities. *Planning Review*, pp. 41–45.

Koulopoulos, T. M., Spinello, R. S., & Toms, W. (1997). *Corporate instinct: Building a knowing enterprise for the 21st century*. New York: John Wiley & Sons.

Quinn, J. B., Anderson, P., & Finkelstein, S. (1996, March-April). Managing professional intellect: Making the most of the best. *Harvard Business Review*, pp. 71–80.

Stewart, T. A. (1998). *Intellectual capital: The new wealth of organizations*. New York: Bantam Books.

Weick, K. E. (1990). Cognitive processes in organizations. In L. L. Cummings & B. M. Staw (Eds.), *Information and cognition in organizations*. Greenwich, CT: JAI Press.

Zuboff, S. (1995). The emperor's new workplace. *Scientific American, 273*(3), 202–204.

Web Sites

WWW Virtual Library on Knowledge Management. (1999). @Brint.com. Retrieved May 1, 2000 from www.brint.com/km/

The Knowledge Management Forum. (2000). Newman, B. D. Retrieved May 1, 2000 from www.KM-forum.org

KMWorld Online. (2000). KMWorld. Retrieved May 1, 2000 from www.kmworld.com

The National Knowledge and Intellectual Property Management Taskforce. (1999). The Center for Advanced Technologies. Retrieved May 1, 2000 from www.km-iptask.org

The Association for Work Process Improvement. (1998). The Association for Work Process Improvement. Retrieved May 1, 2000 from www.tawpi.org

CIO.com. (2000). CIO Communications. Retrieved May 1, 2000 from www.cio.com

Melcrum Online. (1999). Melcrum Publishing. Retrieved May 1, 2000 from www.km-review.com

Knowledge Connections. (2000). David Skyrme Associates. Retrieved May 1, 2000 from www.skyrme.com

Author Index

Abramson, G., 3, 66
Amidon, D. M., 4, 47, 63, 66
Anderson, P., 72
Applehans, W., 71
Bartlett, C. A., 71
Beers, M. C., 12, 67
Berger, P. L., 71
Boland, R. J., 71
Botkin, J., 71
Brand, A., 5, 61
Brown, J. S., 6, 7, 58, 63, 66
Cleveland, H., 8, 66
Cohen, D., 9, 11, 57, 62
Contada, J. W., 71
Davenport, T., 12, 63, 71
Davenport, T. H., 12, 13, 15, 56, 67
DeLong, D. W., 12, 67
Dixon, N., 16, 61
Dorf, B., 43, 66
Drucker, P. F., 17, 68
Duguid, P., 7, 58
Durrance, B., 17, 57
Edfvinsson, L., 38, 69
Fahey, L., 19, 57
Finkelstein, S., 72
Finnerty, P., 19, 57
Fiol, C. M., 71
Geraint, J., 20, 63
Germeraad, P., 20, 65
Ghoshal, S., 71
Gill, T. G., 71
Glasser, P., 21, 56
Glazer, R., 22, 66
Glick, W. H., 71
Glove, A., 71
Grayson, C. J., Jr., 41, 61
Grayson, J., Jr., 22, 56
Hamel, G., 71
Handy, C., 71
Hansen, M., 24, 64
Hansen, M. T., 25, 55
Hargadon, A. B., 27, 62
Hibbard, J., 28, 58
Hildebrand, C., 28, 60, 71
Holtshouse, D., 29
Huber, G. P., 71
Jones, P., 29, 59
Jordon, J., 29, 59
Junnarkar, B., 30, 63
Kelly, K., 31, 70
Kerr, S., 72
Klahr, P., 13
Knapp, E. A., 33, 67
Konno, N., 39, 62
Koulopoulos, T. M., 72
Krogh, G. V., 33, 68
Laugero, G., 71
Leonard, D., 34, 62
Leonard-Barton, D., 35, 59, 68
Liebowitz, J., 36, 57
Luckmann, T., 71
Maggie, M., 37, 69
Malhotra, Y., 37, 58
Marshall, C., 38
Miles, G., 38, 69
Miles, R. E., 38, 69
Morrison, L., 20, 65
Nohria, N., 25, 55
Nonaka, I., 39, 62, 63
Nurmi, R , 41, 59
O'Dell, C., 41, 61
O'Dell, C. S., 22, 56
Pemberton, M., 42, 59
Peppers, D., 43, 66
Perrone, V., 38, 69
Powell, W. W., 43, 59
Prahalad, C. K., 71
Prusak, L., 15, 19, 38, 56, 57
Quinn, J. B., 44, 70, 72
Rogers, M., 43, 66
Ruggles, R., 45, 56
Ruggles, R. L., 46, 67
Rumizen, M. C., 47, 66
Sensiper, S., 34, 62
Shpilberg, D., 38
Skyrme, D. J., 47, 66
Spinello, R. S., 72
Stephenson, K., 48, 61
Stewart, T. A., 49, 59, 72
Svelby, K. E., 50, 68
Teece, D. J., 51, 67, 68
Te'eni, D., 71
Tenkasi, R. V., 71
Tierney, T., 25, 55
Toms, W., 72
Weick, K. E., 72
Wenger, E., 52, 62
Woods, J. A., 71
Zuboff, S., 72

Title Index

Blueprint for 21st century innovation management, 4
Building and sustaining the sources of innovation: An interview with Dorothy Leonard, 34
Capturing value from knowledge assets: The new economy, markets for know-how, and intangible assets, 51
Care in knowledge creation, 33
Changing the role of the top management: Beyond systems to people, 71
Chief knowledge officer: The climax to your career?, 42
Cognitive processes in organizations, 72
Common knowledge: How companies thrive by sharing what they know, 16
Communities of practice: Learning, meaning, and identity, 52
Competing for the future, 71
Consensus, diversity, and learning in organizations, 71
Corporate instinct: Building a knowing enterprise for the 21st century, 72
Creating the boundaryless organization: The radical reconstruction of organization capabilities, 72
Deciphering the knowledge management hype, 37
Designing information technology to support distributed cognition, 71
Financial risk and the need for superior knowledge management, 38
Firms as knowledge brokers: Lessons in pursuing continuous innovation, 27
High-tech hidebound: Case studies of information technologies that inhibited organizational learning, 71
How Avery-Dennison manages its intellectual assets, 20
Human capital: What it is and why people invest in it, 71
If only we knew what we know: The transfer of internal knowledge and best practice, 41
Information mapping: Guiding principles, 71
Intellectual capital: The new wealth of organizations, 72
Intelligent enterprise, 44
Is knowledge management the future of HR?, 37
Is your company ready for one-to-one marketing?, 43
KM and innovation at 3M, 5
Knowing what we know, 28
Knowledge-intensive firms, 41
Knowledge management, 33
Knowledge management: Experts for hire, 28
Knowledge management handbook, 36
Knowledge management made easier, 19
Knowledge management: The well-connected business, 24
Knowledge management tools, 46
Knowledge orientations and team effectiveness, 29
Knowledge research issues, 29
Leadership and the Information Revolution, 8
Learning from collaboration: Knowledge and networks in the biotechnology and pharmaceutical industries, 43
Leveraging collective intellect by building organizational capabilities, 30

Managing customer support knowledge, 13
Managing knowledge: A practical web-based approach, 71
Managing knowledge in the new economy, 9
Managing professional intellect: Making the most of the best, 72
Measuring the knower: Towards a theory of knowledge equity, 22
Mining your hidden resources, 22
New measures of success, 47
New rules for the new economy, 31
Organizational change and redesign: Ideas and insights for improving performance, 71
Organizing knowledge, 7
Packaging what you know, 49
People management, 20
Report on the second comparative study of knowledge creation conference, 47
Research directions for knowledge management, 51
Research that re-invents the corporation, 6
Smart business: How knowledge communities can revolutionize your company, 71
Some conceptual and research barriers to the utilization of knowledge, 38
Some explicit thoughts on tacit learning, 17
Successful KM projects, 12
Sustaining the ecology of knowledge, 6
The age of unreason, 71
The coming of the new organization, 17
The concept of *ba*: Building a foundation for knowledge creation, 39
The eleven deadliest sins of knowledge management, 19
The emperor's new workplace, 72
The formation and incorporation of virtual entrepreneurial groups, 48
The knowledge creating company, 39
The knowledge factor, 21
The knowledge management yearbook, 71
The nature and design of post-industrial organizations, 71
The new organizational wealth: Managing and measuring knowledge-based assets, 50
The role of tacit knowledge in group innovation, 34
The social construction of reality, 71
The state of the notion: Knowledge management in practice, 45
Think tank, 12
Toward a knowledge context: Report on the first annual University of California Berkeley Forum on Knowledge and the Firm, 11
Wellsprings of knowledge: Building and sustaining the sources of innovation, 35
What's your strategy for managing knowledge?, 25
Wiring the corporate brain, 3
Working knowledge: How organizations manage what they know, 15

Company Index

For readers interested in pursuing their own inquiry into how KM practices are developed and implemented in the workplace, this index lists companies cited in this book.

The following companies were discussed in regard to their KM practices.

3M, 5
Access Health Inc., 26
Amazon.com, 43
American Productivity & Quality Center, 22, 42
Avery Dennison, 20
Digital Equipment Corp. [acquired by Compaq Computer Corp.], 12
Ernst & Young Center for Business Innovation, 21, 45, 46
IBM Corp., 10
KPMG International, 20
Memorial Sloan-Kettering Cancer Center, 26
Monsanto, 28
Novartis AG, 3
Price Waterhouse [merged to PricewaterhouseCoopers], 23
Sequent Computers Systems [now a division of IBM], 23, 41
Teltech Resource Network Corp., 28
World Bank, 10, 41
Xerox Corp., 6, 18

The following companies were mentioned only as a reference.

Arthur Andersen, 42, 45
Bechtel Corp., 16
Bell Labs, 45
British Petroleum [merged to BPAmoco], 16
Buckman Laboratories, 41, 47, 49
Canon U.S.A., Inc., 39
Chevron Corp., 16
Citicorp, 45
The Coca Cola Co., 43
Daimler Benz [merged to DaimlerChrysler], 47
Dow Chemical, 11
Ernst & Young, 16
Federal Express Corp., 44, 45
Ford Motor Co., 16
Gemini Consulting, 47
Honda Motor Co., 39
IBM Consulting, 10
Johnson & Johnson, 10
Laura Ashley Co., 44
Lotus Development Corp., 49
Maekawa Electric Corp., 40
Microsoft Corp., 45
Sharp Electronics Corp., 40
Texas Instruments Inc., 41
Toshiba America Inc., 40
Unilever PLC, 47

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The Human Side of Knowledge Management: An Annotated Bibliography Mayer (2000, Stock #349) $20.00
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Feedback to Managers (3rd Edition) Leslie & Fleenor (1998, Stock #178) $60.00*
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If You Don't Know Where You're Going You'll Probably End Up Somewhere Else Campbell (1974, Stock #203) $9.95*
International Success: Selecting, Developing, and Supporting Expatriate Managers Wilson & Dalton (1998, Stock #180) $15.00*
The Lessons of Experience: How Successful Executives Develop on the Job McCall, Lombardo, & Morrison (1988, Stock #211) $27.50
A Look at Derailment Today: North America and Europe Leslie & Van Velsor (1996, Stock #169) $20.00*
Making Common Sense: Leadership as Meaning-making in a Community of Practice Drath & Palus (1994, Stock #156) $15.00*
Managerial Promotion: The Dynamics for Men and Women Ruderman, Ohlott, & Kram (1996, Stock #170) $15.00
Managing Across Cultures: A Learning Framework Wilson, Hoppe, & Sayles (1996, Stock #173) $15.00
Maximizing the Value of 360-degree Feedback Tornow, London, & CCL Associates (1998, Stock #295) $42.95*
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Twenty-two Ways to Develop Leadership in Staff Managers Eichinger & Lombardo (1990, Stock #144) $15.00

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The Human Side of Knowledge Management

An Annotated Bibliography

The technology behind knowledge management is familiar to many managers, but the human side of knowledge management is less familiar. For example, how do motivation and learning affect the individual's acquisition and transfer of knowledge, and how do group dynamics mediate the role of knowledge in an organization? This book reviews the literature that addresses the human side of knowledge acquisition, transfer, and application. The author presents these annotations and a view of knowledge management that provides support for leaders who must capture the information available within their organizations to make sense of and confront familiar and unprecedented challenges during a time of rapid change.

The Author

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87